

Education Rigorous Literature Review



Pedagogy, Curriculum, Teaching Practices and Teacher Education in Developing Countries

Dr Jo Westbrook
Dr Naureen Durrani
Rhona Brown
Dr David Orr
Dr John Pryor
Dr Janet Boddy
Francesca Salvi

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Abbreviations

ABL	Activity-Based Learning
BRAC	Bangladesh Rural Advancement Committee
CCE	Child-Centred Education
CCP	Child-Centred Pedagogy
CPD	Continuous Professional Development
DEEP	Digital Education Enhancement Project
EFA	Education for All
GES	Ghana Education Service
GMR	Global Monitoring Report
ICT	Information and Communication Technology
INSET	In-Service Training
IQS	Integrated Quranic Schools
IRS	Initiation-Response-Feedback
ITE	Initial Teacher Education
KRT	Key Resource Teacher
LCE	Learner-Centred Education
MDG	Millennium Development Goal
MITEP	Malawi Integrated In-service Teacher Education Programme
NCERT	National Council on Educational Research and Training (India)
NEU	Guatemalan Nueva Escuela Unitaria
NGO	Non-Governmental Organisation
NQT	Newly Qualified Teacher
OECD	Organisation for Economic Co-operation and Development
PASEC	Programme d'Analyse des Systèmes éducatifs des États et gouvernements membres de la CONFEMEN (Programme of Analysis of Education Systems of CONFEMEN (Francophone countries))
PCK	Pedagogical Content Knowledge
PEP-ILE	Primary Education Programme - Improvement of Learning Environment
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
QEP	Quality Education Programme
SbTD	School-based Teacher Development and Instructional Materials
SES	Socio-Economic Status

SfL	Schools for Life
SSA	Sarva Shiksha Abhiyan (India)
SSA	Sub-Saharan Africa
TESSA	Teacher Education in Sub-Saharan Africa
TIMDC	Teacher Training and Material Development Cell
TLMs	Teaching and Learning Materials
UPE	Universal Primary Education
ZPD	Zone of Proximal Development

Executive summary

Focus of the review

This rigorous literature review, commissioned by the Department for International Development (DfID), UK, focused on pedagogy, curriculum, teaching practices and teacher education in developing countries. It aimed to: (i) review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers; and (ii) identify critical evidence gaps to guide the development of future research programmes.

The overarching question this review engaged was:

Which pedagogic practices, in which contexts and under what conditions, most effectively support all students to learn at primary and secondary levels in developing countries?

This was explored through three sub-questions:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

Methods

An advisory e-user group comprising ministry personnel, teacher educators, educational researchers, NGOs, foundations and other development partners offered advice and support and commented on the draft initial report and draft final report, and responded to enquiries within their area of expertise.

Nine electronic databases for relevant literature and 17 key journals were hand searched; the websites of key governmental and non-governmental organisations were also searched; citations referenced in identified papers were followed up; and team members, the e-user group and the team's professional contacts were consulted for recommendations of relevant studies and 'grey' unpublished reports and papers.

The review was conducted in two stages. **Stage one** consisted of a systematic 'mapping' exercise on the 489 studies that met the inclusion criteria through coding, giving a broad characterisation of pedagogical practices used by teachers in formal and informal classrooms in developing countries. Studies that met the inclusion criteria of relevance and clarity of method were selected for **stage two**, the in-depth review. Fifty-four empirical studies, reported in 62 publications, using both quantitative and qualitative methods, were included and rated for methodological trustworthiness and quality of contextualisation. A random sample of 15% of studies was double coded for quality assurance. Data from the 45 studies ranking high or moderate on both dimensions were used to address this review's overarching research question.

Results

The review's main claim is that teachers' use of communicative strategies encourages pedagogic practices that are interactive in nature, and is more likely to impact on student learning outcomes and hence be effective. This claim for teachers' use of communicative

strategies is not something that is reported consistently in those terms in the literature reviewed, but it has emerged from an interpretation of the overall body of evidence.

The overall strength of that body of evidence is moderate, with a combination of high- and moderate-quality studies from a range of contexts, relatively numerous in relation to other rigorous and systematic reviews, but mostly of observational-descriptive studies. Studies were not directly comparable, with different aims and research methods and a variety of outcome indicators to assess effective pedagogic practices. Evidence comes from studies of not only interventions but also reforms and existing conditions, so that these practices indicate what is possible under difficult conditions, with large, multilingual classes and scarce resources, and where students come from poor or marginalised backgrounds. The evidence is strongest in the consistency of findings on the extent to which teachers are able to implement the pedagogical strategies and practices envisaged by reforms and training. There is also convergence in how studies report that curriculum and teacher education can best support effective practices. However, there is less robust evidence of the way these strategies and practices impact on student learning outcomes, as few studies used baseline and post-tests or school or national student achievement data, and many used greater student engagement and confidence as general but not rigorously evidenced indicators.

The review identified that pedagogic practice is developed through interaction between teachers' thinking or attitudes, what they do in the classroom and what they see as the outcome of their practice. The review identified two specific **teacher attitudes** that encouraged the use of three interactive and communicative strategies; these in turn facilitated implementation of six specific teaching practices that were used in effective ways and engaged students. These attitudes were teachers' positive attitudes towards their training and their students, which positioned them in the best frame of mind to construct the teaching and learning process as an interactive, communicative process in which teaching involved provoking a visible response in their students that indicated that learning was taking place. Three **specific strategies** that promoted this interactive pedagogy were identified:

- feedback, sustained attention and inclusion;
- creating a safe environment in which students are supported in their learning;
- drawing on students' backgrounds and experiences.

The above strategies formed a basis for developing the **six effective teaching practices**, although not all of these needed to be simultaneously present:

- flexible use of whole-class, group and pair work where students discuss a shared task;
- frequent and relevant use of learning materials beyond the textbook;
- open and closed questioning, expanding responses, encouraging student questioning;
- demonstration and explanation, drawing on sound pedagogical content knowledge;
- use of local languages and code switching;
- planning and varying lesson sequences.

While all teachers may use the above practices, the key difference is that the most effective teachers use them communicatively, paying attention to their students and placing them centrally in their construction of the teaching-learning process. These effective teachers recognise the need to provoke a positive response in students and do so in more interactive, communicative ways, so that students engage, understand, participate and learn. All of the above practices, even when used alone, if carried out in this interactive and communicative way, are then effective in the classroom. Brought together as a package in an intervention or carefully constructed curriculum, supported by

relevant professional development, they might make a considerable impact on student learning.

How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

The review identified four key findings in relation to the third question: (i) teacher peer support; (ii) alignment of professional development with teachers' needs, the promoted pedagogy and modes of assessment of their practice and follow-up monitoring of teachers; (iii) support from head teachers; and (iv) alignment of forms of assessment with the curriculum.

Research gaps

Research design

None of the studies evaluated the impact of interventions/reforms using control and treatment schools. A small number of studies used inferential statistics to correlate specific practices with student cognitive attainment; however they missed details of pedagogic practices. Observation-descriptive studies that drew on mixed methods and used standardised tests or national tests to measure the impact of interventions did not always use baseline tests. Qualitative studies that looked at reforms or existing conditions gave significant details of students, teachers, contexts and practices, but did not systematically assess students' learning.

Future research designs should be of a *larger scale* combining *qualitative and quantitative methods*, with both *baseline and post-tests* measuring student attainment as a result of an intervention or reform and systematic, structured classroom observation. The *Indicators and measures* used should include students' perspectives and experiences of school and classroom life, teachers' understanding, student discourse and immediate understanding of a concept taught, student participation in class, use and frequency of teaching and learning materials (TLMs) and attendance patterns over time. Longitudinal studies looking at long-term impact over more than three years would show how reform or interventions work (or not) in altering practice in situ. *Randomised controlled trials* are more difficult and costly but will give more precise findings of 'what works'. Assessing *teachers' content and pedagogical content knowledge* via questionnaires using classroom-based scenarios and tests, and comparing this to the assumed knowledge in the curriculum and as indicated in teachers' actual practice would also be useful.

Contexts

Further research is needed in remote rural schools, with large classes and the uncertainties of teacher and student presence. Future studies should also report on the social, economic and cultural *backgrounds of students' homes* in relation to pedagogy in detail. Likewise, more research targeted on schools for *students with disabilities* or how such students are integrated into mainstream schools, would fill a major gap. Another gap was studies focusing on *teachers' practices at lower and upper secondary levels*, looking at continuities with the primary curriculum and pedagogies. Additionally, difficulties of having *overage students* in classes did not emerge. Further studies could focus on how teachers positively handle classes where there are overage students in the same grade and class. Few studies reported on the *characteristics of teachers*. This made it harder to make comparisons between different categories of teachers. Studies comparing experienced and novice teachers or looking at the transition that novice teachers make in becoming more effective would fill a gap.

Pedagogy

The communicative strategies found in this review could be tested out through an intervention but getting further details of teachers' feedback and attention, group work and use of TLMs, demonstration and explanation in large classrooms.

Teacher education

Investigations of the *effectiveness of training* should explore pedagogy holistically as constituting teachers' thinking, including their knowledge, both content and pedagogical content knowledge (PCK), their practices and the impact of these on students' outcomes and with a narrower focus on a particular subject. Studies looking specifically at how *teacher educators* are trained, how they develop their own practice and PCK over time or how they develop a community of practice through collaboration in networks and individual and collective reflection, would fill a visible research gap. Further research is needed to take a longer view of how *peer support works*, its cost-effectiveness and the factors that supported successful peer support in order to strengthen the evidence.

Curriculum and assessment

Few studies analysed the forms of assessment, both formative and summative, that teachers used in relation to the curriculum. Studies using a mixed methods approach to understand assessment practices and their relationships to pedagogy and student learning over time would fill this gap.

Dissemination and impact of research

Examples of how a particular piece of research directly impacted on teachers' practices or on policy would be of considerable interest.

1. Introduction

1.1 Aims and rationale

This rigorous literature review has been commissioned by the Department for International Development (DfID) and focuses on the four interrelated areas of pedagogy, curriculum, teaching practices and teacher education in developing countries. It aims to review existing evidence to inform future programme design and policy-making undertaken by the Research and Evidence division of the DfID, other agencies and researchers for the global good. In particular, it aims to present:

- a clear and authoritative overview of the frameworks and assumptions which underpin pedagogic practices in developed and developing countries and in relation to curriculum and teacher education;
- an authoritative summary of the quality and extent of evidence supporting those assumptions, focusing on developing countries;
- existing evidence for developing effective pedagogic interventions in lower- and middle-income countries that can guide development expenditure;
- critical evidence gaps to guide the development of future research and spending programmes.

The overarching question for this review is:

Which pedagogic practices, in which contexts and under what conditions, most effectively support all students to learn at primary and secondary levels in developing countries?

This overarching question is broken down into three further sub-questions:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

The first two sub-questions primarily ask **what** is going on, **how** teachers are teaching where pedagogies are identified as successful and what reasons are put forward for **why** they are successful in their context. Because pedagogic terms such as ‘student-centred’ or ‘child-centred’ or ‘constructivist’ are used generically, the decision was made to focus on more concrete pedagogical strategies and practices to understand what worked and what did not. The third question seeks to understand the extent to which curriculum and teacher education are enabling factors in the most effective pedagogies identified, recognising that the curriculum is the reference point for the pedagogical strategies and practices used by teachers, and that teacher education formally introduces teachers to the curriculum and its pedagogy and to the teaching profession.

1.2 Policy background

The Education for All (EFA) goal of ensuring that all children have access to, and complete, good quality, free and compulsory basic education (six years of primary school and three years of lower junior secondary school) remains a challenging one. Full access

for girls, disabled and poor children, migrants, refugees and ethnic minorities is still difficult to achieve and many children continue to experience poor-quality schooling.

In this global context the classroom pedagogy used by teachers is consistently seen as ‘*the* crucial variable for improving learning outcomes’ and is critical in any reform to improve quality (UNESCO, 2005, p.152). Over the last two decades, many developing countries have embarked on major curriculum and pedagogical reforms to meet the EFA goal, often with donor involvement. Development partner pressure may have prompted countries to reforms that encourage more student- or learner-centred, active and outcomes- or competency-based education, but these ideas have also been favourably received at the local level as a means for achieving educational, economic, social and political goals (Chisholm and Leyendecker, 2008). However, even when well-planned, their implementation has not always been as successful as hoped, and evidence suggests that a wide gap exists between the expected goals of curriculum reforms and actual progress achieved in classrooms, schools and numbers of teachers (Chisholm and Leyendecker, 2008, Dembélé and Lefoka, 2007, World Bank, 2008).

Children may find themselves without a teacher or in crowded classrooms with a poorly trained or untrained teacher: two million more teachers are needed to achieve EFA by 2015 and 3.4 million teachers are needed to replace those who leave. In 33 countries, 75% of teachers were not trained to the required standard or did not have sufficient schooling for solid content knowledge (UNESCO, 2012). Data from three recent studies indicate that in sub-Saharan Africa and South Asia, many students spend years of instruction with no progress on basics (Piper, 2010, Pritchett and Beatty, 2012, Sumra, 2010). If students do not learn the basics early on, the rest of the curriculum is inaccessible to them, often leading to early school dropout. Worldwide, 120 million children do not reach grade 5 (UNESCO, 2012). Where content is determined rigidly by grade and not by achievement, once children have failed, they continue to fail, resulting in the ‘spiral build-up of learning matter’ for teachers in secondary school to deal with for the 48% of primary leavers who are succeeding in entering lower secondary school in developing countries in larger numbers (World Bank 2008, p. xii). This cumulative effective subsequently adds to the potential recruitment pools of secondary-qualified but undereducated primary school teachers.

Inequality within countries is also manifested, whereby some children succeed - often urban boys from wealthier backgrounds - while others are ‘silently excluded’, failing to understand what is going on in the classroom. Gaps in learning between urban and rural children, able and disabled, rich and poor, boys and girls, have increased since 1990 (UNESCO, 2012). UWEZO’s 2011 survey in Kenya showed that only 28% of grade 3 students from the poorest fifth of households had achieved expected numeracy skills, compared with 48% from the richest fifth (UNESCO, 2012). These wealth disparities also compound other inequalities, for example 60% of rich boys in Burkina Faso attain foundation skills, in contrast to 40% of rich girls and only 5% of poor girls or boys (UNESCO, 2012).

Equity of learning figures centrally in international discussions now taking place to set post-2015 development and learning goals. The completion of a quality basic education of nine years for all students, measured by learning outcomes, is the key overarching goal. This review contributes to those international discussions and goals.

1.3 Conceptual framework and terminology

This section presents an overview of the frameworks, theories and assumptions that underpin pedagogic practices in developed and developing countries and in relation to curriculum and teacher education. The discussions here have informed the conceptual framework of the review, the coding of studies and the conclusions.

Pedagogy

Pedagogy itself is a contested term, but involves activities that evoke changes in the learner: Watkins and Mortimore define pedagogy as ‘any conscious activity by one person designed to enhance learning in another’ (1999, p.3). According to Bernstein, pedagogy ‘is a sustained process whereby somebody(s) acquires new forms or develops existing forms of conduct, knowledge, practice and criteria from somebody(s) or something deemed to be an appropriate provider and evaluator’ (Bernstein, 2000, p.78). Bernstein contrasts two models of pedagogy that focus on the teacher’s organisation, management, discourse and response to the students and which provide a useful theoretical framework with which to understand different pedagogic approaches:

Performance model: visible pedagogies where the teacher explicitly spells out to the students what and how they are to learn, with a recognisable strong framing or lesson structure, collective ways of behaving and standardised outcomes;

Competence model: invisible pedagogies with weaker framing that result in an ostensibly more informal approach where the teacher responds to individual children’s needs, with hidden or unfocused learning outcomes (Bernstein, 1990).

This review found Alexander’s definition of pedagogy most helpful, wherein teaching ‘is an act while pedagogy is both act and discourse’ (Alexander 2001, p.540). Pedagogy comprises teachers’ ideas, beliefs, attitudes, knowledge and understanding about the curriculum, the teaching and learning process and their students, and which impact on their ‘teaching practices’, that is, what teachers actually think, do and say in the classroom. Teacher beliefs are contextually based, and Alexander’s definition also encompasses social, cultural and political aspects.

Pedagogic approaches

Teachers’ thinking and ideas are manifested in their overall pedagogic approaches, garnered from the kinds of teaching and learning experienced as school students themselves, the approaches promoted in initial teacher education (ITE) and continuing professional development (CPD), those specified in the current school curriculum and those pervasive in colleagues’ classrooms. Recent curriculum reforms have moved away from ‘teacher-centred’ pedagogic approaches to more ‘student-’, ‘learner-’ or ‘child-’ centred, or ‘active’ learning approaches. Less explicitly and sometimes more distantly, pedagogic approaches are also informed by theories of learning, such as behaviourism and social constructivism (as further discussed in 1.4 below).

Pedagogic strategies

Teachers’ strategies signify their dispositions towards teaching and learning and are a more concrete expression of their approach, wanting, for example, their students to feel safe, or encouraging their participation or cultivating a cheerful teacher persona or being seen as a knowledgeable and authoritative figure.

Teaching practices

Teaching practices are the specific actions and discourse that take place within a lesson and that physically enact the approach and strategy. Taking a cue from Alexander (2001), teaching practices comprise:

- teacher spoken discourse (including instruction, explanation, metaphor, questioning, responding, elaboration and management talk);

- visual representation (using a chalkboard, writing, diagrams, pictures, textbook, learning aids such as stones, experiments, drama) to understand or construct the new knowledge being presented or indicated to the learners;
- the act of setting or providing tasks for learners to cognitively engage with new content or develop physical skills, such as experimentation, reading, writing, drawing, mapping, rehearsing, problem solving, practising;
- a variety of social interactions, in which language is central between learners or learners and teacher such as pairs, groups, individually or whole-class;
- teachers' monitoring, use of feedback, intervention, remediation and formative and summative assessment of the students or assessment by the students themselves.

'Effective pedagogy'

As with the term 'pedagogy', the term 'effective' is contested. The ultimate goal of any pedagogy is to develop student learning, and yet the 2005 Global Monitoring Report on quality (UNESCO, 2005) includes creative, emotional and social development as indicators of quality learning. In order to include a wide number of studies on pedagogy, the review has conceptualised 'effective' pedagogy as those teaching and learning activities which make some observable change in students, leading to greater engagement and understanding and/or a measureable impact on student learning. Implicit in these definitions is a starting point or baseline with which to contrast the observable change in behaviour or learning taking place as a result of a teacher's pedagogy.

An alternative term we could have used in this review is that of 'quality', referring not merely to school, national or international student examinations or assessments but also to the quality of the human interaction in the classroom through appropriate pedagogy, including freedom from corporal punishment (Alexander, 2008; Barrett et al., 2007; Moreno 2005; Barrow, et al., 2007; Tikly, 2011; UNESCO, 2005). Within this latter understanding, equity of learning is seen as an essential indicator of quality (Leu and Price-Rom, 2006; Price-Rom and Sainazarov, 2010). 'Quality', however, can be seen as looking at the relationship between school inputs, such as quantitative surveys of textbooks and other physical school resources and student achievement, but studies focusing on these range from showing 'significant positive associations' (Barrett et al., 2007, p.22) to others which state that 'there are no clear and systematic relationships between key inputs and student performance' (Hanushek 1995, p. 232, cited in Barrett et al., 2007). Alternatively, other studies see quality as encompassing the more complex pedagogical issue of the way resources are used in teaching and learning that affects students' achievement (Alexander 2007; Barrett et al., 2007; Somerset, 2011).

On a larger scale, education systems and international monitoring bodies, including the Global Monitoring Report (GMR), are increasingly using assessments or tests of cognitive achievement as proxies for learning outcomes and therefore quality of education. International surveys such as PIRLS, PISA and PASEC are widely used as measures of academic achievement, as well as local and national examinations. Pre-PIRLs are being increasingly used in developing countries at primary levels, and with the plans for a single reference point for measuring learning in developing countries from UNESCO's Learning Metric Task Force after 2015 (UNESCO, 2013), such international indicators will have a far greater reach and influence within developing countries.

Alexander (2008, p.18) argues however for 'national accounts of quality to have a distinctively national and indeed local slant'. He distinguishes indicators of quality from measures, recognising that there are non-measurable indicators that may be culturally or contextually specific but difficult to gauge by objective measurements. Bearing

Alexander's warning in mind here, 'effective' teachers' pedagogic practices in this review are broadly interpreted and seen in the outcomes they engender. Measurements of enhanced student cognition are key, but other indicators are included, such as changes in student confidence, participation or values, and social indicators such as teacher-student interaction and inclusion. Secondary outcomes of successful learning as a result of effective teacher pedagogic practice may be higher student attendance, use of resources, use of specific practices and stakeholder satisfaction, such as parents and community members (Orr et al., 2013).

1.4 Theories of learning

Initial searching for this review confirmed that many of the terms and categories used to describe pedagogical theory and practice are contested and subject to multiple interpretations and uses. Terms such as 'constructivism' or 'student-centred', when used across, and even within contexts can obscure rather than clarify and conceptualise. Details of practices used are sometimes not given either, with assumptions that they are already known. This section therefore sets out to analyse and critique the theories of learning that underpin the different pedagogical approaches seen in developing countries and to explain some of the assumptions implicit within them.

Behaviourism

Behaviourism emerged as a theory of learning from the work of Thorndike (1911), Pavlov (1927) and Skinner (1957), becoming dominant in the 1960s and 1970s; these the scientifically proved laws of stimulus-response and classical and operant conditioning were used to explain the learning process through the use of rewards and sanctions - or trial and error. This was seen as biologically driven, a form of adaptation to the environment. The learner is rewarded for small steps of learning and achievement with consistent positive reinforcement. The behaviourist model was later challenged by social learning theory, where children were seen to learn via observation (Bandura, 1977) or imitation side by side with adults in an apprenticeship model.

Broadly speaking, behaviourism supports teacher-controlled or -centred approaches where the teacher is the sole authority figure. Knowledge is parcelled out from different parts of a separated curriculum that children experience as distinct subjects, and directed from the teacher to the students in set sequences, with little student choice or interaction. Assessment is often exam-oriented and high stake, without teachers' direct involvement. Drawing on Bernstein, such performance pedagogies would be highly visible to the learner, strongly framed and paced by the teacher, with subjects strongly classified. Pedagogic approaches that can broadly be described as 'behaviouristic' in origin may result in practices such as lecturing, demonstration, rote learning, memorisation, choral repetition, imitation/copying or 'master-classes' (e.g. learning music or dance). 'Structured' or 'direct/explicit instruction' as a practice differs in being teacher-led rather than teacher-centred, and indicates that teachers follow a particular sequence, often scripted and even prescriptive, as in the teaching of early reading, but this may develop into more student-centred activities at a later stage of the lesson (Barratt, Sajid et al., 2007). Behaviourism could be held to be universal as a theory, applicable within a variety of contexts, both cost- and time-efficient and require fewer resources, including demanding less-qualified and -skilled teachers. Critiques of behaviourism lie in the surface-nature of the knowledge acquired and the way in which the 'one-size-fits-all' approach excludes students with individual differences, or where the teacher remains unaware of students' current knowledge or misconceptions, or where the use of sanctions such as corporal punishment as a deterrent is acceptable.

Constructivism

Based especially on the work of Piaget (1896-1980), constructivism differs from behaviourism in theorising the mind as inherently structured to develop concepts and acquire language. Individual learners actively explore their environment by building on their existing cognitive structures or schemas. When these schemas are adequate to deal with a new object, situation or problem, learning occurs through a process of assimilation. When an existing schema is not adequate to deal with a new object, situation or problem, a process of accommodation is required whereby learners modify their existing schema. Constructivist approaches see that activities are provided to build on children's current knowledge and match their appropriate developmental stage, and challenge them so that through the process of accommodation, they continue to make progress. Individual and group work centred around problem solving and project work is appropriate. Concrete activities are privileged for younger children, with activities involving symbolic and abstract thought reserved for older students.

While the terms 'student - or learner-centred' pedagogies are sometimes used interchangeably with child-centred education (CCE), the latter has a different and longer history. In child-centred education, as developed by Locke, Rousseau and Froebel from the late 1600s onwards, pleasure, interest and playfulness are seen as central to the child within an integrated curriculum in which the children commune freely with nature and have some agency over their own learning. This approach to children's education has influenced practitioners in Europe, Russia and America. In England, the Plowden Report of the 1960s advocated child-centred pedagogy for primary schools, and it remained a dominant and idealised form of pedagogy labelled as 'progressive' until the 1980s. This is Bernstein's competence model: invisible pedagogic practices with less direction or instruction of the whole class by the teacher, greater individualisation, weaker classification and framing, with a slower pace and hidden or disguised learning outcomes. Child-centred learning pedagogies can be theorised as influenced by constructivism, and can be seen in: modern Montessori and Steiner pedagogies for pre-school children; experiential learning, e.g. learning in outdoor contexts such as Forest Schools in Denmark; and Activity-Based Learning in Tamil Nadu, India.

While Alexander points out that 'Child-centredness is a pervasive attribute of teaching, not a specific teaching method' (Alexander 2007, p.17), in developing countries, Altinyelken, drawing on Carney (2008) points out that it 'enjoys an almost hegemonic position with its "justified", "admirable" and "inspiring" educational ideas' (Altinyelken 2010b, p.153). Critiques of child-centred education would, however, suggest that it is context-specific rather than universal, and possibly elitist in its outcomes. Children from middle-class backgrounds are more likely to be familiar with the culture and expectations of the school. Critics such as Bernstein and Bourdieu and post-structuralists such as Foucault considered child-centred education to be a covert form of social control, disempowering the working-class child and those from ethnic minorities and pathologising them to promote the hegemony of the middle class.

Social constructivism

Social constructivism sees knowledge as socially constructed and learning as essentially a social process. It is mediated through cultural tools, above all by language, which needs to be the learner's first language or at least one very familiar to them, and facilitated by drawing on examples or contexts familiar to the learners so that meaning making is prioritised. Teachers apply this model by setting up a 'Zone of Proximal Development' (ZPD), that is, an area of activity where, with the aid of a teacher or more knowledgeable peers, students are able to do what they cannot achieve alone (Vygotsky 1986). Learning involves students gradually internalising this social activity with higher order cognitive

development or thinking directly developed and structured by their external social speech. Children's natural or 'spontaneous' concepts meet with and are further developed by the scientific or more abstract concepts they are taught in school or by an adult through guided instruction (Vygotsky 1986). Such scaffolding or guided support requires a skilful mix of teacher demonstration, praise, minimisation of error, practice and direct instruction (Wood et al., 1976). Pedagogic practices consistent with social constructivist approaches prioritise student-teacher or student-student interaction. Small-group, pair and whole-class interactive work, extended dialogue with individuals, higher order questioning, teacher modelling, showing, reciprocal teaching and co-operative learning can all be seen as justified by social constructivism. To this extent, social constructivism could be seen as supporting student- or learner-centred pedagogy, terms which feature very strongly in curricular reform in developing countries, although social constructivism would suggest a much stronger role for the teacher than would be suggested by student- or learner-centred. Assumptions around student-centred pedagogy are that teachers share their students' language and culture, accept a more democratic and less authoritative role, and know how to set up effective group work and tasks and to offer skilful supported instruction at the point it is needed. Furthermore, space is needed for flexible social groupings, and within this, students need to feel that they have the right to talk and contribute to their peers' learning. Inherent within this is a recognition of the student as a person with rights, taken on formally by UNESCO within Child Friendly Schools, with its human rights-based approach to schools and pedagogy.

Critical pedagogies

Critical pedagogies, originating from Paulo Freire (1972) in Brazil, aim towards pursuing a fuller humanity, social emancipation and transformation, led by 'the oppressed', such as the poor and women. This is through a dialogic, reflective approach wherein the teacher is no longer authoritative but, as an intellectual, enables students to develop critical consciousness (*conscientização*) of their own oppression and to act on the world as they learn in order to change it. The large-scale reforms in South America, such as Escuela Nueva in Colombia and the Guatemalan Nueva Escuela Unitaria, can be seen to be based on critical pedagogy.

Table 1.1 summarises the broad theoretical schools of thought underpinning different pedagogies in developed and developing countries. It may be more helpful to consider these as having blurred boundaries rather than as neat categories, as in reality, these overlap considerably - as the review confirms.

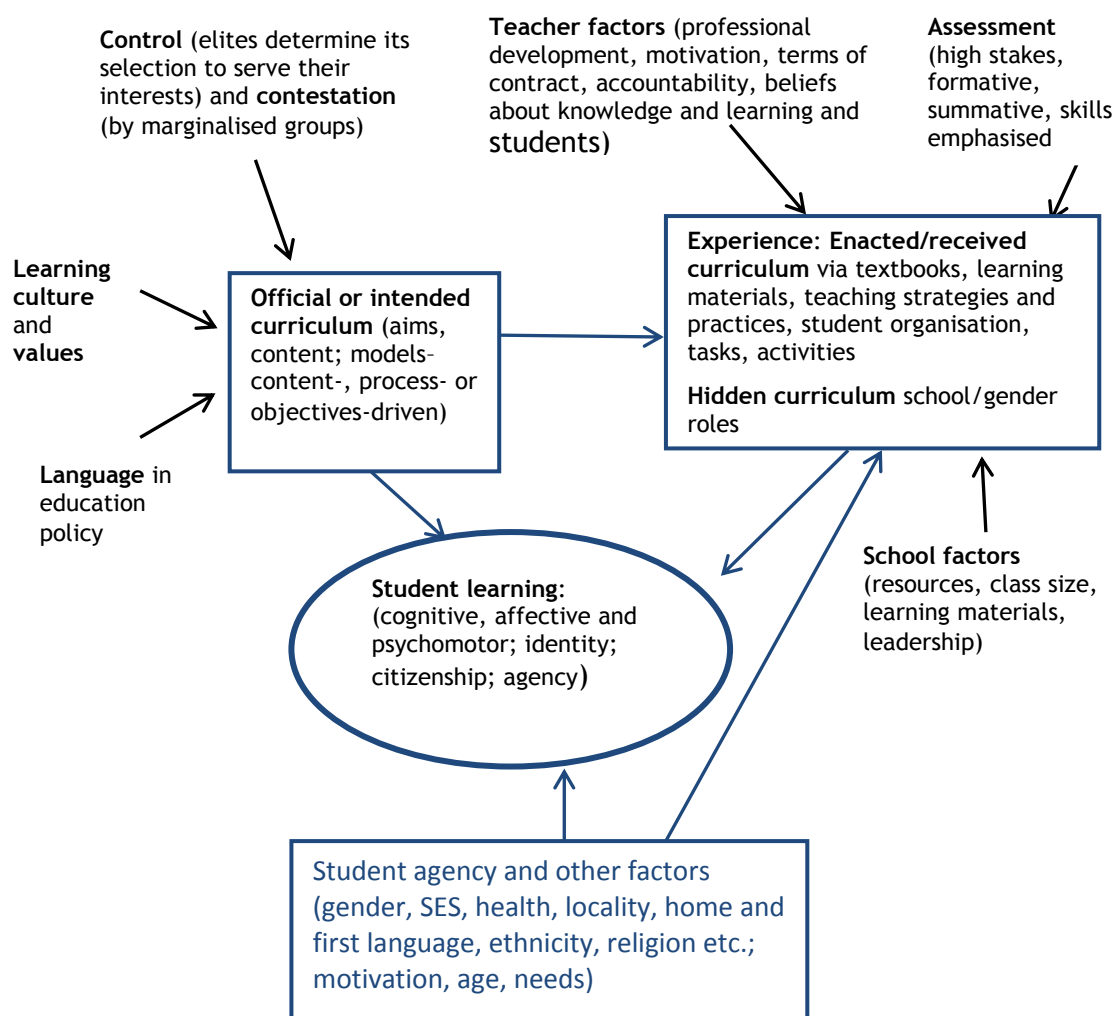
Table 1.1: Theoretical schools of thought and associated pedagogies

Broad theoretical school of thought	Associated pedagogy	Examples of pedagogies in developed countries	Examples of pedagogies in developing countries
Behaviourism	Teacher-centred learning 'Performance', visible pedagogy	Whole class teaching, working together as a collective (Japan, the Pacific Rim) Focus on mastery of skills in a particular sequence	Lecturing, demonstration, direct/explicit instruction, rote learning, choral repetition, imitation/copying, 'master-classes' (e.g. learning music or dance)
Constructivism	Child-centred learning 'Competence' or invisible pedagogy	Project work; individual activity, experiential, Montessori; Steiner; Pestalozzi in US and Europe	Activity-Based Learning in Tamil Nadu Bodh Shiksha Samiti schools in India
Social constructivism	Teacher-guided Learner-/student-centred learning	Reciprocal teaching of reading in US Communicative learning Co-operative learning Group work element in national strategies, England	Small-group, pair and whole-class interactive work, extended dialogue with individuals, higher order questioning, teacher modelling, showing, problem solving, inquiry-based, Nali Kali in India, thematic curriculum in Uganda
Liberationist, democracy Critical theory	Critical pedagogies	Critical pedagogies such as Philosophy for Children in England Student voice	Escuela Nueva in Colombia Guatemalan Nueva Escuela Unitaria (NEU)

1.5 Curriculum

The curriculum is the key reference point for teachers, particularly in developing countries, where it is encoded in the official textbook and teacher guides, often the sole resource used by teachers. Teachers' pedagogic approaches, strategies and practices thus serve to enact the curriculum. The curriculum links the macro (officially selected educational goals and content) with the micro (the act of teaching and assessment in the classroom/school), and is best seen as 'a series of *translations*, *transpositions* and *transformations*' (Alexander, 2009, p.16; original emphasis). The official curriculum is transacted and in the process gets transformed, as 'teachers and students interpret, modify and add to the meaning' embodied in the official specification (ibid.). Thus, curriculum, pedagogy and assessment are interrelated and mutually influence one another in the day-to-day classroom interaction (Bernstein, 1975, Alexander, 2009). In addition, the understandings and learning that students acquire are mediated by student-related factors such as student agency, motivation, home language, needs, age, gender and socio-economic status (SES). Figure 1.1 indicates these relationships.

Figure 1.1: A framework for understanding the official and enacted curriculum



There are four models of the curriculum that are found globally and in developing countries:

1. Content-driven curricula exemplify Bernstein's 'collective' code, in which subjects such as mathematics or science are used to describe the curriculum, with increasing specialisation for older students. The key concept is discipline, which 'means accepting a given selection, organization, pacing and timing of knowledge' in the pedagogical relationship between the teacher and the taught in order to cover the curriculum (Bernstein, 1975). Knowledge is transmitted in a situation where the teacher has maximal control.
2. Process-driven curricula exemplify Bernstein's 'integrated' code, in which the content areas stand in an open relation to each other. Students have more discretion over what is learnt compared to individual teachers, who have to collaborate with colleagues from other disciplines. Process-driven curricula include a range of models - cross-curricular, integrated, interdisciplinary, thematic. Multiple forms of assessment are used, with a focus on formative, personal, course-work-based and open-ended assessment (Ross, 2000).
3. Objectives-driven curricula are structured around sets of expected learning outcomes, which are written by specifying the kind of behaviour as well as the

context in which that behaviour is expected to operate, e.g. comprehending, applying, analysing, starting with lower-order objectives and moving to increasing levels of complexity (Tyler, 1949). Driven by utilitarian ideals, content is usually selected on the basis of its relevance to the workplace.

4. Competence- or outcomes-based curricula are structured around sets of learning outcomes that all learners are expected to be able to achieve successfully at the end of their learning experiences (Botha, 2002). Curriculum, instruction, and assessment are organised in a way that makes sure that this learning ultimately happens. It is considered to produce life-long learners who can better adapt to the world of work, and is considered inherently more democratic.

Curriculum: power and social change

The curriculum reflects officially and ideologically selected knowledge (Apple, 1982), but is also a vehicle for change – what the society wants to be in the future. Thus, ‘curriculum change often goes hand in hand with and reflects social change’ (Paechter, 2000, p.5). By deciding to educate children differently, social transformation might be realised (Young, 1971). However, such a process is likely to be contested and resisted, especially if the changes are ‘perceived to undermine the values, relative power and privileges of the dominant group involved’ (Young 1971, p.34). The curriculum thus may be contested between groups who want to preserve and those who wish to change certain features of their society (Aldrich, 1996) (see Figure 1.1). Many curricula often exclude women, national/ethnic/religious minorities or people with disabilities, or represent them in specific and limited ways (Anyon, 1979, Sleeter and Grant, 1997, Durrani, 2008, Durrani and Dunne, 2010). At secondary level, for the majority of students in sub-Saharan Africa, the language of instruction and examination is not their native language, and therefore proficiency in the medium of instruction is an important requirement for successful evidence of learning (World Bank, 2008). This has equity implications, as students who are proficient in the language in which their learning is assessed are at an advantage compared to those who are not. Since language is both a source of identity and a key means by which people can either gain access to power or be excluded from it, the issue of the medium of instruction has equity implications (Rassool, 2007) (see Figure 1.1).

1.6 Teacher education

Teacher characteristics, knowledge and learning

The status of teachers as professionals with a body of knowledge to draw on, as experts with professional academic freedom, is challenged by global curriculum and work reforms that place more demands on them but diminish their participation and autonomy, so that teachers’ status has declined rather than increased over the last 23 years (Robertson, 2012). That body of knowledge itself is challenged through increased numbers of unqualified and undereducated teachers passing through alternative routes to the classroom.

Teacher characteristics as they enter teacher education are heterogeneous and include: gender; background in terms of location within a country (urban/rural); educational experience and qualifications; teaching experience; attitudes and beliefs around teaching and learning (Lewin and Stuart, 2003, Pryor et al., 2012). Such characteristics differ widely between countries; for example, the educational qualifications of teachers in Senegal are far more varied than those in Uganda, having implications for the kind of training that will meet their heterogeneous needs (Pryor et al., 2012). The theory of andragogy or adult learning suggests that adults build on these characteristics, and in contrast to children, have their own developed self-concept, have greater learning

readiness and can take on practical, problem-solving approaches. Prior experience may also, however, block out acceptance of new concepts or content. Experienced teachers routinise much of their practice, making it habitual and automatic, built on tacit, situated knowledge (Eraut 2000; Knowles et al., 2005). This can also be ritualistic. Novice teachers, on the other hand, need to learn their practice consciously, while avoiding cognitive overload (Abadzi, 2006). The role of reflection in altering and improving practice has strong currency in teacher learning for overcoming ritualisation, and can be seen as moving teachers from just thinking about how a lesson went, to more immediate ‘reflection-in-action’ (Schön, 1987), to the more radical approach of getting trainees to reflect critically on their own developing practice and on the societal context in which they find themselves (Zeichner and Liston, 1987).

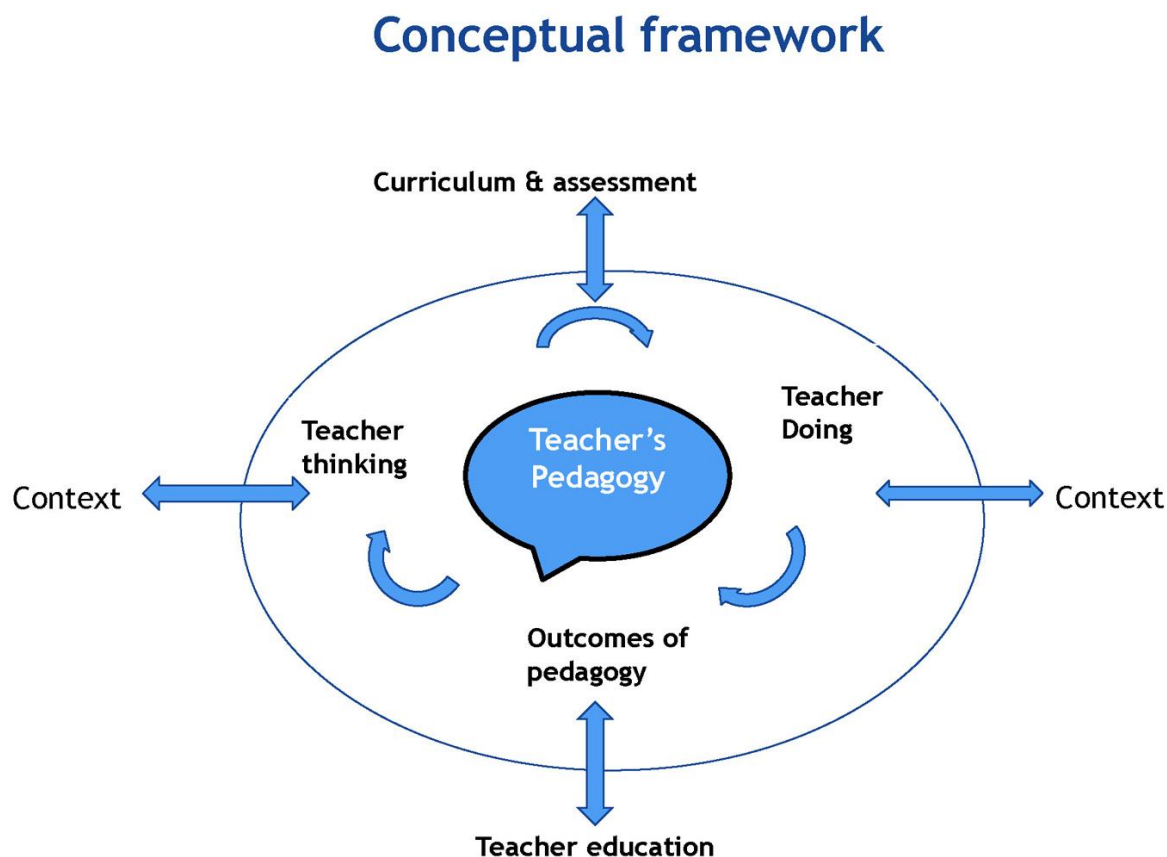
Shulman’s (1987) knowledge base for teachers continues to be an influential framework, and consists of the domains of content, pedagogical and curriculum knowledge, and knowledge of learners, educational contexts and ends. His concept of pedagogical content knowledge (PCK) is central to effective pedagogies, that is, how teachers represent content knowledge in ways that students can grasp, anticipating difficulties and building in support such as using images, verbal explanations, relevant examples, metaphors and actions. Teacher learning has recently shifted from an emphasis on the individual towards the concept of teacher-learning communities based on theories of situated cognition that recognise the importance of social engagement arising from the particular contexts and institutions in which teachers practice (Lave and Wenger, 1990, Shulman and Shulman, 2004). Situated cognition builds on social constructivism, but holds that ‘knowledge is situated, being in part a product of the activity, context, and culture in which it is developed’ (Brown et al., 1989, p.32). Learning occurs when students participate in activities that are ideally in authentic situations, or those that approximate as closely as possible to the contexts in which the knowledge will later be required. Authentic tasks and simulations that approximate to ‘real’ situations with teachers modelling expert practice are central pedagogic approaches in this theory of learning. Such collaborative teacher professional development is seen as key to improving education systems globally (Mourshed et al., 2010). Influential theories of learning for teacher educators from the US include structured classroom lesson observations, taking inquiry as a professional stance and modelling practices through ecological ‘thinking aloud’ (Cochran-Smith, 2003, Lunenberg et al., 2007, Stallings and Mohlman, 1988).

1.7 Conceptual framework

Curriculum and pedagogical reform is a complex process which cannot be targeted singly and in isolation from other interlinked components within the education system or the social, economic and political context in which the reforms are implemented. Several studies identified the need to link curriculum (reforms) to teacher education and pedagogy (Coulthas and Lewin, 2002, Lewin and Stuart, 2003, Dembélé and Lefoka, 2007, Pridmore, 2007, Bates, 2008, World Bank, 2008, Pryor et al., 2012), as curriculum reforms are often designed and implemented without parallel reforms in initial teacher education and continuing professional development (Dembélé and Lefoka 2007; World Bank 2008).

From the discussion in Section 1.3, pedagogy encompasses teacher thinking and teacher doing, the one impacting on the other, and with the third dimension of the visible, observable and measureable impact of the teachers’ pedagogy on the learners themselves that renders those pedagogic practices ‘effective’. These three aspects of teacher thinking, doing and their impact on student learning outcomes therefore make up ‘effective pedagogy’, as seen in Figure 1.22. The relationship of curriculum and its assessment modes and teacher education to teachers’ thinking and doing within a specific context are part of this conceptual framework, and can be conceptualised as enabling or disabling teachers’ thinking and doing.

Figure 1.2: Conceptual framework: enabling and constraining factors in effecting pedagogical change



1.8 Research questions

The discussions above on pedagogy, curriculum and teacher education have informed the design of the research questions for the review. This review has one overarching question:

Which pedagogic practices in which contexts and under what conditions most effectively support all students to learn at primary and secondary levels in developing countries?

‘Effectively’ is understood as making some observable or measureable impact on student learning, such as quality of interaction or student attainment, and within this is the need for all students to learn in an equitable fashion. We have broken this overarching question down into three further questions to support the methodology for this review and to structure the final report:

1. What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?

This question asks more generally as a first stage of analysis, what is going on in classrooms in developing countries, and is answered largely by the narrative overview.

2. What is the evidence on the effectiveness of these pedagogical practices, in what conditions and with what population of learners?

This question focuses on the way in which studies have reported what the evidence is for the effectiveness of a particular pedagogic practice and involves assessing the quality of the studies, undertaken at the in-depth review stage. It evaluates the

given details of teachers' pedagogic practices and the material conditions in which these take place, the ways in which they address issues of equity, their impact on students' learning and the nature of their relationship to curriculum and teacher education.

3. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

This final question supports the analysis of how far the pedagogic practices that teachers use align with and are supported by the school curriculum and with those used in teacher education.

2. Methodology for the review

2.1 Overview of methodology

Relevant literature was searched for, using electronic databases, key journals, websites, reference lists and advice from key contacts. A two-stage process followed, which involved:

1. Screening and coding of studies for the thematic overview

Inclusion criteria (see Section 2.2) were first applied to screen out the studies that did not contribute sufficiently to answering the research questions. Papers meeting the criteria were read and coded in order to develop a thematic overview to answer the first question: *What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?* As the purpose of the thematic overview was to survey the research field and hence descriptive and thematic data were the main area of interest, theoretical studies were included alongside empirical ones, and studies were not assessed on methodological quality at this stage. The process and its results are described in Chapter 3 of this review.

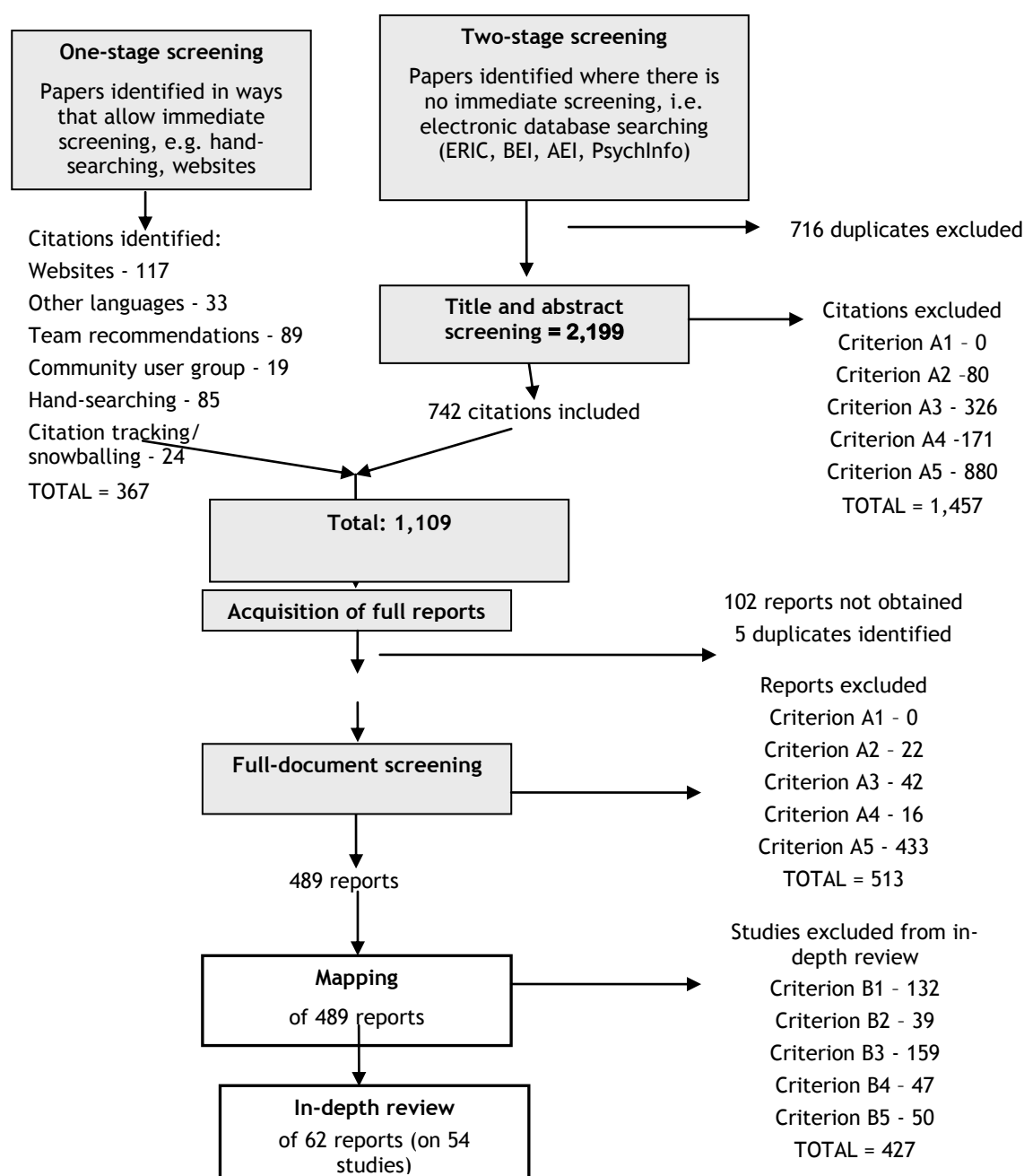
2. Screening and rating of studies for the in-depth review

Studies that met further inclusion criteria relating to relevance and clarity of reporting were then selected for stage three: in-depth review. All studies selected for this stage were empirical rather than theoretical, and both quantitative and qualitative research methods were considered. The studies were rated for the Weight of Evidence they provided on two counts: methodological rigour and quality of contextual detail given. Data from the studies ranked higher with regard to Weight of Evidence were used to address this review's main research question: *Which pedagogic practices, in which contexts and under what conditions, most effectively support all students to learn at primary and secondary levels in developing countries?* and the third question: *How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?* The process and its results are described in Chapters 4 and 5 of this review.

Figure 2.1 shows the process in full detail.

User input

In addition to the DfID, other potential users of this review are government ministries, teacher educators, educational researchers, NGOs, foundations and other development partners. Representatives of these users were directly involved through an advisory e-user group (see Appendix 1), who commented on the draft initial report and draft final report, and responded to enquiries within their area of expertise. In addition, the review team is indebted to a wider group of international academics, researchers and other contacts known to the team, who provided 'grey' unpublished reports and papers, and who will receive the final report and aid dissemination.

Figure 2.1: Filtering of papers from searching to mapping to in-depth review

2.2 Searching

Nine electronic databases were searched for relevant literature, using a defined search strategy (see Appendix 2). In addition: the 2000-2013 volumes of 17 key journals were hand-searched; the websites of key governmental and non-governmental organisations were also searched; citations referenced in identified papers were followed up; and team members, the community user group, and the team's professional contacts were consulted for recommendations of relevant studies (see Appendix 3). The same inclusion criteria were applied equally to published and grey literature. Supplementary searches were carried out using Google Scholar in French, Spanish and Urdu in order to explore the non-English language literature as far as possible within the resources available.

3. Thematic overview: What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?

3.1 Overview and aims

Studies were not evaluated at this stage for their quality, but for what they could tell us about research into the pedagogic practices being employed in developing countries. The account given of these papers should therefore not be taken as endorsement of the findings. However, taking an inclusive approach to the studies considered, particularly with regard to methods, this thematic overview enables the review to convey a fuller picture of the topic than if had it relied only on the comparatively narrow coverage of those qualifying for in-depth review. Since methodological and reporting standards vary widely in this field, particularly in the grey literature, exclusion on these grounds would risk capturing only a partial picture of the existing research and excluding many relevant voices. Indeed, the thematic overview foreshadows the review's main findings, but keeping it separate from the in-depth review avoids compromising the exacting quality assessment of method and contextualisation that informs the review's main conclusions.

Screening: inclusion/exclusion criteria for thematic overview

The review sought to identify studies of interventions, current practice, concepts and theories focusing on pedagogy in primary and/or secondary schools. By extension, studies focusing on teacher education and/or the curriculum were also included, insofar as they contributed to understanding and knowledge of teachers' pedagogic practice. Empirical studies of all designs, peer- and non-peer reviewed research papers, research syntheses, unpublished literature and theoretical papers were all considered for inclusion within mapping.

The following inclusion criteria were applied to screen all studies for relevance to mapping:

A1. Must have been published after 2000

These date limits were applied to ensure that the included literature was relevant to contemporary realities.

A2. Must contain some element of new findings, theory or synthesis of existing research

This criterion was applied in order to exclude publications such as book reviews or textbooks, which might meet the other criteria but (for the purposes of this review) add nothing to the research they summarise.

A3. Must focus significantly on a low- or middle-income country setting or settings

Regions and income levels used in the study follow World Bank classifications (<http://data.worldbank.org/>) as recorded in April 2013.

A4. Must focus on primary, secondary or senior school levels of education, either directly or indirectly

Papers which focused on education in teacher training colleges were considered to focus indirectly on school-level education, where those teachers would then go on to teach in primary, secondary or senior schools), and were therefore included.

A5. Must focus significantly on pedagogical practices, that is, actual teaching practices taking place between an educator and a learner in an educational setting

This could include studies focusing on pedagogical theory, curriculum and/or teacher education, if they were discussed *in terms of their effects on pedagogical practices*.

Certain topics, although arguably quite relevant to determining pedagogic practice, were excluded under this criterion. Teacher management issues (e.g., incentives, absenteeism), although potentially affecting teachers' commitment and morale, and hence pedagogy, were specifically excluded from consideration by the review's terms of reference. Three other topic areas were largely excluded, as they overlapped with other reviews concurrently commissioned by the DfID: early childhood and cognitive development; literacy, foundation learning and assessment; and language of instruction in education. Studies dealing with these themes were included only if they had a strong coexisting focus on pedagogic practices in the classroom.

Studies which did not meet all five criteria were excluded from the review (see Figure 2.1 for numbers).

Coding of studies for the thematic overview

All studies included within the thematic overview were coded according to a framework designed to capture key themes and areas of interest. The codes were developed on the basis of an initial scoping exercise and input from the user group, and are shown in Appendix 4.

In total, 489 papers were included at the mapping stage, the majority of which were primary and empirical studies (69%). Most often, studies examined pedagogy as the main focus but also often in relation to one or both of the other key areas of the review: teacher education and curriculum. The papers covered primary and secondary education in low-income, lower-middle-income and upper-middle-income countries from sub-Saharan Africa, North Africa, the Middle East, East Asia, the Pacific, Central Asia, South Asia, Latin America and the Caribbean. Studies predominantly focused on sub-Saharan Africa (over 40%) and primary or upper secondary (69%). An additional 13% of studies referred to both primary and secondary levels. With only 18% studies focusing on upper secondary, the literature on pedagogic practices at this level was much smaller. The empirical studies reported on both interventions (n=181) and reforms (n=89). Slightly fewer focused on existing conditions (n=158), where interventions and reforms may have played a part but were not highlighted.

Section 3.2 maps the findings in relation to pedagogy. Following this, Section 3.3 presents the findings on curriculum in relation to pedagogy. Section 3.4 then looks at teacher education in relation to pedagogy, covering ITE, CPD and training unqualified teachers. Finally, Section 3.5 sums the discussion up by highlighting key findings in relation to question 1 of the review. Identified research gaps are also highlighted.

3.2 Pedagogy

Following the conceptual framework (Sections 1.3-1.7), this section discusses the findings on pedagogy under four main headings: pedagogical approaches, pedagogy as practice, pedagogy as ideas, and pedagogy and equity.

Pedagogical approaches

The three pedagogical terms most commonly used in the studies to describe or promote specific approaches were learner- or student-centred (n=100), child-centred (n=37) and activity-based learning (n=30). However, the spread of these terms varied by region, with approaches reported as student-centred dominating in sub-Saharan Africa, whilst activity-based, student-centred and child-centred approaches were distributed more evenly in

South Asia. More than a third of the studies did not explicitly use a pedagogical approach, but four main terms were found to be the most frequently occurring when describing practices: ‘active’ (n=23), ‘participatory’ (n=15), ‘co-operative’ (n=12) and those promoting ‘inquiry’ (n=12).

Constructivism and social constructivism (n=40 and 20 respectively) were the most frequently referred to theories. In some cases this reference outlined the approach underpinning the intervention itself. Examples included studies which explicitly drew on social constructivism to examine strategies for teaching argumentation in science teaching in South Africa (Braund et al., 2013), research which tied support and guidance for teachers in INSET to a Vygotskian social constructivist approach to adult learning in Namibia (O’Sullivan, 2001b) and donor-supported reforms encouraging active-learning pedagogies based on constructivist notions of teaching and learning in Nicaragua (Sanyal, 2009). However, in many other cases, references to these terms framed the theoretical orientation of the study rather than any actual initiative.

Constructivism and social constructivism were also featured in a number of studies which claimed that there was a clash between imported theories and local culture, practices and beliefs, especially where hierarchical relations are based on gender or ethnicity and where children asking questions of adults is viewed as disrespectful. Other studies focused on the material constraints of these settings, arguing that the adequate space and resources, small class sizes and autonomous teachers needed for learner-centred pedagogies are not present in these contexts (Horn, 2009, Jansen, 2009, Tabulawa, 2003, Vavrus et al., 2011). Ampiah and Mankoe (2006) found that social constructivist approaches were ‘not popular’ with teachers and ‘do not seem to resonate well’ with the Ghanaian curriculum. The more teacher directive forms of teaching in Indian and Kenyan classrooms were also found to stand in opposition to ‘western notions of dialogic pedagogy’ underpinned by social constructivist theories (Pontefract and Hardman, 2005, Smith et al., 2005). Other studies explored the co-existence of local traditions, for example those associated with mastery learning in Islamic or Brahminic traditions, and ‘progressive’ imports and the extent to which they are compatible (Ainscow, 2000, Alexander, 2001, Ginsburg, 2010, Lavia, 2007, Tabulawa, 2003).

A key consideration highlighted by a number of studies was the need for any application of theories into practice to be locally relevant and appropriate (Croft, 2002, Dembélé, 2005). Wambach (2009) is positive about **convergent pedagogy** promoted in francophone countries, based overtly on social constructivism and supporting learning in both mother tongue and second language, separately and in parallel, and with project-based learning, differentiation and formative assessment as its central pillars. Similarly Roegiers (2008) makes strong claims both for the effectiveness and acceptability of pedagogies of integration based on constructivism within competency-based and more holistically themed and integrated curricula. However, neither of these studies met the criteria for in-depth analysis. A striking research gap within the studies ‘is the voice of young learners in developing countries’ on their views on ‘LCE [learner-centred education], and on classroom life under attempts at its implementation’ (Schweisfurth, 2011, p.430).

Structured pedagogy and direct instruction, including guided practice, is advocated by some researchers and UNESCO (2005), who argue that self-discovery as seen in more child-centred practices can lead to misinterpretations which take time to be corrected and may create cognitive overload and overburden children’s and teachers’ working memory (Abadzi, 2006, 2012, 2013, Kirschner et al., 2006). The review did not, however, identify any empirical studies that report on the use of information-processing as an approach to understanding why children are not learning or cognitive approaches to teacher training in low- and middle-income countries. The Gyan Shala non-state private provision of education was reported to be associated with positive learning outcomes for children from very poor backgrounds in the states of Bihar and Gujarat. In these schools the emphasis is

on ‘learning-based’ education, with curriculum supported by worksheets for students and step-by-step detailed lesson plans for teachers, whose main strategy is repeated demonstration of expertise. However, none of the studies reporting on the Gyan Shala provision made it to the in-depth review. In O’Sullivan (2003, 2004), unqualified teachers in Namibia were given structured lesson plans using a simplified learner-centred approach that resembled direct instruction, moving teachers from learner to ‘learning centred’. De Stefano et al. (2007) report that students receive more direct and focused instruction in complementary education programmes in Ghana, Mali and Egypt, with a curriculum focused on the acquisition of basic literacy and numeracy skills using the local language. Robust empirical evidence on the effectiveness of interventions focusing on structured pedagogy such as the one practised in Gyan Shala schools would be useful.

Pedagogy as practice

The number of studies claiming positive findings in terms of pedagogic practices (n=203) outnumbered those giving negative outcomes (n=179). This may partly reflect the fact that the authors reporting the interventions had frequently been involved in implementing them, as well as possible publication bias towards publishing positive findings in preference to negative ones. The terms used to describe overall approaches such as ‘student-centred’ and ‘constructivist’ are used loosely, and as in the examples below on active and student-/learner-centred pedagogy, they appear to be very similar.

The practices and issues highlighted in the following discussion are largely representative of **primary and upper primary levels**. Studies that reported positively on effective practices labelled ‘**active pedagogy**’ characterised them as:

- students working with various objects individually and in groups, solving problems, and exploring spaces other than the classroom in Escuela Nueva schools (Benveniste and McEwan, 2000);
- ‘students working in pairs or small groups in order to make meaning of the lesson’ supported by ‘the teacher’s skill in eliciting information, asking questions, and following up questions to support learning’ (Barrow et al. 2007, p. 4).

Studies that reported positively on practices labelled as ‘**student-/learner-centred**’ frequently characterised them as involving one or more of the following:

- examples and questions drawing on students’ previous knowledge and experience (Arkorful, 2012, Barrett, 2007, Childs et al., 2012, Epstein and Yuthas, 2012, Nyaumwe and Mtetwa, 2006);
- problem solving and higher order thinking skills (Megahed et al., 2008);
- instructional aids (Clarke, 2003, Coffey, 2012, Giordano, 2008, Hardman et al., 2009, UNICEF, 2008);
- good relationships and interaction between teachers and students (Blum, 2009, Lefoka and Sebatane, 2003);
- pair and group work (Hamid and Honan, 2012, Joong, 2012, Stuart, 2002).

Some studies’ findings of positive or effective pedagogies were based on accounts by teachers of their own practices (Abuhmaid, 2011, Brown, 2012) while others give descriptive accounts of what was planned in an intervention with little evidence of its actual implementation (Ajiboye and Ajitoni, 2008, Haiplik, 2002, Warwick, 2000). However, several studies explicitly addressed this issue by comparing teachers’ accounts and views with their knowledge and understanding of pedagogical aims and with observations of actual lessons. These studies report that whilst teachers often

demonstrated an understanding of the principles underpinning the pedagogy advocated by the intervention or reform, they were less able or willing to implement them in the classroom under often challenging conditions (Buckler, 2011, Dembélé and Lefoka, 2007, Levinson, 2004, Mhlauli, 2010, Pomuti et al., 2005). In many cases, the outward mechanics of the practice were enacted without the underlying principle being observed, for example, putting students into groups but allowing interaction only between the teacher and student (Barrow et al., 2007, Mtika and Gates, 2010), or making superficial links between students' experiences and the subject content (Rogan, 2007).

A cluster of studies claiming effective **multigrade practices** in rural areas report on Escuela Nueva in Colombia and the similar Nueva Escuela Unitaria in Guatemala. Although they cite challenges, especially in up-scaling, a number of positive outcomes, such as improved student achievement and reduced drop out and repetition, are attributed to the holistic, bottom-up approach involving in-service teacher education, peer support, resources (especially teachers' manuals) and community involvement (Benveniste and McEwan, 2000, Colbert, 2009, de Baessa et al., 2002, Kline, 2000). Similarly, innovative classroom organisation, teaching practices and curriculum and learning materials development are reported in small multigrade rural schools in India offered by the Rishi Valley Institute for Educational Resources (RIVER) in Andhra Pradesh and by Bodh Shiksha Samiti in Rajasthan (Blum, 2009, Blum and Diwan, 2007). However, none of these studies met the inclusion criteria for in-depth review, suggesting that more robust studies of these potentially effective interventions are needed.

In terms of positive findings, some studies made very strong claims for the **use of ICT**, not only as potentially enhancing group learning in Egypt, South Africa and Chile, but as Leach described, as amongst other qualities, supporting more inventive and playful pedagogies and expanding student horizons beyond classroom walls (Leach, 2004, Hinostroza et al., 2002). Liu (2010) claimed that ICT shifted teaching towards constructivism in China where the computer became tutor, tutee and tool rolled into one.

Studies reporting positive use of specific practices at **upper secondary level** tended to highlight improved use of group work, often in relation to encouraging discussion, argumentation and student-student interaction (Agrawal, 2004, Bimbola and Daniel, 2010, Qhobela, 2012, Voogt et al., 2009). Some teachers were seen to have a better understanding of the importance of collaboration and were able to design and assign effective group tasks which promoted learner autonomy as well as aligning with lesson content objectives. Kuchah and Smith (2011) in Cameroon reported that the teacher effectively used groups of students with nominated leaders to gather texts and collaborate in the selection and completion of tasks in order to deal with over 200 students and a lack of textbooks. Several studies point to the omission from classroom teaching of skills development in some areas, e.g. oral and communication skills, as they are not tested in the national examinations (Abdullah et al., 2012, Agrawal, 2004); this connects with teachers' common perceptions that participatory classroom activities such as role play and drama are not academically valuable (Chanda, 2008). A number of studies reported on the low cognitive demands of teachers' questions, a focus on recall and the lack of teacher feedback to build on students' prior knowledge (Balarin and Benavides, 2010, Barton and Sakwa, 2012, Braund et al., 2013, Halai, 2010).

A common discourse for reporting on **ineffective pedagogic practices** across the studies involved the terms 'teacher-centred/-dominated/-directed', 'ritualised' and 'authoritarian', all carrying negative connotations (Ackers and Hardman, 2001, Alexander, 2001, Hardman et al., 2012). These practices were often further described as being over-reliant on transmission of knowledge, recall, rote learning, memorisation, repetition, recitation, copying from the board, choral response and 'chalk and talk' (Lewin and Stuart, 2003, Moloi et al., 2008). A number of the studies also cited verbal and physical abuse as a common and damaging practice (Alhassan and Adzahlie-Mensah, 2010, Davies,

2012). Combinations of these terms and factors can paint a very negative picture, however. Terms such as teacher-centred or rote learning require further unpacking as they can be used without always recognising that their potential impact on student learning may be positive or negative. For example, a smaller number of studies recognised that practices labelled as teacher-centred do not necessarily render the student powerless or passive (Tabulawa & Tjombe, 2004, Schweisfurth, 2011), and furthermore, that labelling or describing pedagogies in dichotomous terms is not useful: ‘there must be room for both student centredness and teacher directivity in the teaching-learning process’ (Dembélé 2005, p. 174).

A theme that consistently emerged concurrently with ineffective practices was a **lack of resources** as a major obstacle (Childs et al., 2012, Geeves et al., 2006, Holland et al., 2012). A few studies reported that though new resources existed, teachers were not using them (Khamis, 2011, Khan, 2012) or were not using them as they were intended (Sriprakash, 2010). Reasons given for the lack of use of teaching and learning materials (TLMs) were that teachers had no time (Brehance et al., 2007) or they did not want resources to be damaged or lost, for example by being taken home (Sherman and Muehlhoff, 2007). A number of studies identified the content and use of textbooks as negative factors. Content quickly became out of date (Lewin and Stuart 2003), and did not represent the populations it served in terms of gender (Halai 2010) and urban/rural children (Taylor and Mulhall, 2001).

Pedagogy as ideas

As argued in section 1.3, pedagogy comprises what teachers do in the classroom, but also their ideas, knowledge and attitudes in relation to the learners, the teaching and learning process and the curriculum. A total of 123 studies reported some form of **positive finding** in terms of teachers’ ideas and knowledge. Four main themes emerged from the studies focusing on **primary level** education. First, studies reported that teachers had changed their attitudes as the result of training or interventions. This could be the inclusion of marginalised groups (Dyer, 2008); ceasing corporal punishment after a three- to five-day training on human rights (Bajaj, 2011) or simply being more friendly towards students (Nga and Dinh, 2008). Second, primary teachers developed into more critical, reflective professionals; were encouraged to use their professional judgement in action research projects (Alsop et al., 2010) and saw themselves as agents of change in relation to socialisation and learning processes (Brownlee et al., 2012, Sweeting et al., N.D.). Third, some studies highlighted the positive impact of teachers working together, in schools or in clusters (Giordano, 2008, Guzman et al., 2000), and using these opportunities to collaboratively solve problems (Belay et al., 2007, Binns and Wrightson, 2006, Kanu, 2005). Finally, teachers’ enhanced knowledge was reported, be it subject knowledge, awareness of indigenous knowledge or PCK (Dorner and Gorman, 2011, Leach, 2004, Marshall and Sorto, 2012, Suzuki, 2006).

Teachers at **secondary level** were also reported as having increased enthusiasm, knowledge and confidence as a result of effective interventions. For example, Agyei and Voogt (2011) and Li and Walsh (2011) reported more confidence in ICT skills while Shohel and Power (2010) identified teachers’ improvement and confidence in English language knowledge and skills. Three other studies claimed that teachers had gained better knowledge of their learners and were more able to view students’ learning as linked to their teaching and teacher learning (Balakrishnan, 2007, Dayoub and Bashiruddin, 2012, Johnson et al., 2000); however, Onderi and Croll (2009: p.97) found that ‘teachers can have a sense of themselves as competent classroom performers and educational professionals without necessarily having a strong sense of efficacy with regard to pupil outcomes’.

Five main themes emerged from studies reporting some form of **negative finding** (n= 120) in terms of teachers' ideas and knowledge. The first and largest group highlighted teachers' lack of subject knowledge as a key problem. Some looked at the generally low levels of academic achievement of potential teachers (Akyeampong, 2003); others focused on poor content knowledge specifically in language and mathematics (Pryor et al., 2012, Bhattacharjea et al., 2011); and a number addressed weaknesses in new curriculum subjects such as environmental education (Nkambwe and Essilfie, 2012). The second theme was that of resistance to change, and this was variously attributed to teachers' ingrained beliefs (Arifa Rahman et al., 2006); the fear of a loss of authority (Lall, 2011) or difficulty in 'letting go' in order for students to learn more independently (Dai et al., 2011). Further reasons for resistance were linked to the perceived added burden of active-learning or student-centred methods in terms of time and work, especially with large classes (Mizrachi et al., 2010, Stoffels, 2005). Some studies described a diluted or shallow implementation due to teachers' lack of PCK or lack of understanding (Barton and Sakwa, 2012, Conway et al., 2012).

The final two themes are related to key issues of equity in relation to teachers' perceptions. Several studies highlighted a barrier to change being teachers' deficit view of their students, especially if their students were poor, rural or disabled. Teachers' negative attitudes towards students with disabilities came up several times across a range of settings, for example, Amr (2011) in the Middle East. Further studies found that teachers' cultural constructions of students from lower castes and understanding of gendered relations remained unaltered (Clarke, 2003, Halai, 2009). The fifth and final theme is that of language of instruction which is intrinsically linked to pedagogy and curriculum and several studies here, whilst not having language as the main focus, highlighted the problems for teachers and students when the language of instruction is not a familiar language (Clarkson and Idris, 2006, Hardman et al., 2012, Pryor et al., 2012).

Pedagogy and equity

Around one-third of the studies reported on interventions or reforms with respect to equity. Studies in sub-Saharan Africa were far more likely to include a focus on gender, whereas in every other region studies were as likely or more likely to report on issues of rural children and low socio-economic status. Only 27 studies included a specific focus on disability and inclusion, indicating a neglected area both in practice and in research. Studies which identified some positive outcomes cited changing teacher attitudes towards students with disabilities and hence practice through professional development (Charema, 2010, Heijnen-Maathuis, 2005), good school and peer support for teachers (Brown, 2012, Ahmmed et al., 2012) and a degree of autonomy and creativity in adapting curriculum materials (Anandalakshmy, 2007, Le Fanu, 2010) as key factors, while lack of teacher support and agency was identified as a barrier to inclusion (Croft, 2010, Mukhopadhyay and Moswela, 2010, Singal, 2008). A number of studies highlighted that the curriculum itself disadvantaged marginalised groups, especially rural children (Balarin and Benavides, 2010) and girls, particularly through poor representation in textbooks (EdQual, 2007). Further studies reported groups being marginalised by the language of instruction of the curriculum, e.g. ethnic minority children in China (Dello-Iacovo, 2009).

However, the expectation of adapting the curriculum, creating resources and planning different types of tasks and lessons can place an additional burden on teachers if they are not given corresponding support and training (Le Fanu, 2010, Mukhopadhyay and Moswela, 2010). Further reasons for the lack of success in effectively including disabled children included the over-reliance on whole-class and rote-learning teaching methods, a lack of resources and the negative backwash effect of high-stakes examinations; the same issues are also raised with able-bodied students, but the effects are exacerbated by failure to consider their inequitable effects on those students who do have a disability (Arbeiter and

Hartley, 2002, Lynch et al., 2011). Further barriers were the lack of training or knowledge to deal with heterogeneous groups (Adeyemi, 2009, Akyeampong et al., 2013), lack of sensitisation to disabled children's needs (Chanda, 2008) and teachers taking a negative view of students from particular backgrounds (Dyer et al., 2004). As in other areas of this review, studies focusing on inclusion and equity issues identified the problem of policies and recommended practices being out of touch with the local conditions and classroom realities (Croft, 2010, Le Fanu, 2013, Todd and Mason, 2005).

3.3 Curriculum

In total, 101 studies focused on the curriculum, though the distinction between curriculum and pedagogy was often blurred, given that in the day-to-day-classroom interaction, curriculum and pedagogy mutually impact on one another. In terms of **models**, curricular change in almost all cases was to replace content-driven curricula by what could be described as process- and objective-driven curricula. This shift was designed to create knowledge that could be applied rather than just reproduced and that was relevant to learners, though different terminology in different countries gave different emphases to this. *Outcomes-based* and *competency-based* curricula - terms used especially, though not exclusively, in southern Africa and in francophone countries respectively - stress the teaching of skills and attitudes as well as knowledge, all of which are then to be integrated and applied by students (Cross et al., 2002, Roegiers, 2008). This may also be the intention in *thematic* and *interdisciplinary* curricula - e.g. in Uganda (Altinyelken, 2010) and China (Zhu, 2010), but in these, the integration of subject knowledge is highlighted.

Several studies addressed the need for innovations in curricula suited for **multigrade classrooms** which are and are expected to be the reality in several developing countries, particularly in remote, rural and disadvantaged areas (Little et al., 2008, Pridmore, 2007). However, only one of these studies (Vithanapathirana, 2006) was included in the in-depth review and although this reports improvement in students' learning outcomes, it is silent on classroom processes and the ways the curriculum is enacted. Therefore, empirical studies of innovations in curriculum for multigrade classrooms that encompass a holistic view of curriculum looking at both the intended and the enacted curriculum as well as the impact on students and the teaching learning process would be useful.

Many studies found that **curriculum reforms** were at best no more than partially successful in meeting their goals. While it was often reported that teachers expressed enthusiasm for the new curricular approaches, they did not have the necessary understanding or support to implement the curriculum as intended, so new practices were specified which were then not well implemented because the approach was not understood and did not mesh with the teachers' overall strategies (Altinyelken, 2010, Ma et al., 2009). Several studies found curriculum reform to involve convergence of old with new forms, with overloaded content and too fast a pace for the majority of students who were then left behind, especially girls (Ottevanger et al., 2007, Paine and Fang, 2006, Pillai, 2003, Rogan and Grayson, 2003, Tanner and Antonowicz, 2013, Todd and Mason, 2005, Wang and Zhao, 2011). New curricula were often implemented mechanically and without reflection on their relevance or application (Braund et al., 2013); occasionally, this was found to have damaging effects on student learning. For example, Dello-Iacovo (2009) notes an almost total abandonment of direct teaching in some rural Chinese schools, with significant negative effects on attainment, while Balarin and Benavides (2010) describe how Peruvian teachers understood an emphasis on process to indicate that learning content was no longer important, leading to students missing out on key concepts. Other authors, meanwhile, reported better - albeit still partial - outcomes, such as teachers starting to ask about process in China (Li and Ni, 2011) or developing their abilities to plan rather than charging straight into a topic in Thailand (Sahasewiyon, 2004).

Scaffolding and support with new curricula were key to developing higher-level teaching, as in its absence teachers tended to default to traditional, entirely directive curricular approaches (Agyei and Voogt, 2011, O'Sullivan, 2002a). Teachers often misunderstood the intentions and meaning of new curricula, partly due to the mismatch with teacher training (Jennings, 2001, Mizrachi et al., 2010, Pryor et al., 2012). A time lag may well persist between intervention and implementation, which the shorter-term remits of the studies were unable to capture. Longitudinal studies investigating the build-up over five to ten years of national curriculum reform and the influence of different interventions would perhaps give a different picture (Riddell, 2008).

The success of curricular reform and initiatives was found to be influenced by the degree of consultation and involvement that took place (Bregman et al., 2008). Some studies argued that **teacher involvement in curriculum planning** had not occurred, leaving teachers professionally disempowered by a top-down process and hampered by lack of understanding of the reforms' intentions, and the reforms themselves missing a grounding in the realities of the classroom (Al-Daami and Wallace, 2007, Lai, 2010, MacJessie-Mbewe, 2004, Rogan, 2007). While acknowledging the desirability of teacher involvement in curricular planning, Scheerens (2004) argues that in many low- and middle-income countries, teachers need more structured guidance on how to teach.

Localised or indigenised curricula seek relevance to learners through decentralising the curriculum to enable inclusion of activities and knowledge that are seen as useful and appropriate to the lives of particular groups of children in particular (Alderuccio, 2010, Shizha, 2007, Taylor, 2004). A similar approach of local adaptation of curriculum is seen in the Colombian Escuela Nueva programme or Activity-Based curricula in India and Ghana (Pridmore, 2007). Adapting to the curriculum to local conditions, partly by reducing the scope is seen in accelerated curricula such as School for Life (SfL) in Ghana (Arkorful, 2012). A degree of success in localising the curriculum and adapting centralised curricula to local realities and ideas of knowledge was reported from Mozambique (Alderuccio, 2010, Dhorsan and Chachuaio, 2008), Afghanistan (Jones, 2007) and Cambodia (Middleborg, 2005). Across these different country contexts, good community links and/or local teachers were common positive factors. More equivocal findings come from: Bhutan, where teachers were concerned that localisation meant that students missed out on international perspectives (Childs et al., 2012); Malawi, where efforts to localise the curriculum failed either to overcome the strictures of the national curriculum or to integrate local knowledge successfully (MacJessie-Mbewe, 2004); India, where it has been questioned whether indigenous knowledge can in fact survive incorporation into the educational system (Sarangapani et al., 2013); and Zimbabwe, where teachers were reported to dismiss indigenous knowledge and privilege only knowledge that came from textbooks (Shizha 2007). Thus the evidence on successful innovations in localising curriculum is at best mixed.

The conceptual framework underscored the significance of the **alignment between the curriculum and forms of assessment**. Misalignment with unchanging high-stakes examinations was reported by several as a barrier to teachers' implementation of new curricula (Agrawal, 2004, Barrett et al., 2007, Bregman et al., 2008, Joong, 2012). This was intensified when parents felt that quality education required authoritative teachers and assessment by examination (Holland et al., 2012; Le Fanu, 2010). Interestingly, South Africa has developed a hybrid assessment system where standardised tests in primary school are used for diagnostic purposes by teachers as well as for public information (Chisholm and Wildeman, 2013). Two studies suggest that competency-based education is led by economics and produces students with skills for the workforce but reinforce inequalities (Hirtt, 2009, Tabulawa and Tjombe, 2009) while Pritchett and Beatty (2012) critique the ways in which schools' outward appearances as 'good schools' mask a deficit of learning, compounded each time they need to take on board new curriculum initiatives.

3.4 Teacher education

Fifty-four studies looked primarily at teacher education, the majority of which were from sub-Saharan Africa. This section presents the findings under three main headings: ITE, CPD and training untrained teachers.

Initial teacher education

Around 40% of the studies were on ITE. The conceptual framework highlighted the interconnecting nature of pedagogy, curriculum and ITE. However, several studies described outdated forms of ITE as being misaligned to the school curriculum and as overly theoretical and distanced from actual school contexts. A number of studies cite the omission of newer curriculum subjects, such as health, environment and peace education, in the ITE curriculum, and others state that the needs of rural and multigrade schools are overlooked (Blum, 2009, Bhattacharjea et al., 2011, Dyer et al., 2004). Teacher educators continue to use lectures, question and answer, and basic group work rather than the pedagogic approaches promoted in schools (Lefoka and Sebatane, 2003, O'Sullivan, 2010, Pryor et al., 2012), while the unguided and unsupervised practicum trainees' experiences in schools remain a case of 'sink or swim' for them (Schwille et al., 2007). Some studies question the usefulness of ITE (Lewin and Stuart, 2003), while others cite the untapped potential of ITE, with its lasting influence on a critical mass of teachers (Dembélé and Lefoka, 2007, Pryor et al., 2012). It seems that a greater acceptance of the potential of ITE has developed over time, with more recent publications more likely to express a positive view.

Studies suggesting improvements in ITE argue that teacher educators need relevant school experience, need to develop their own pedagogy for teacher preparation and need to use the interactive methods and group work promoted in school curriculum (Bhattacharjea et al., 2011, Mohono-Mahlatsi and van Tonder, 2006, Obanya, 2010). Experiencing and observing good practice is seen as a key development tool for teacher educators, trainees and teachers alike, either directly or through video clips (Abadzi, 2012, Gao et al., 2011, O'Sullivan, 2005). Innovative practice was seen in Zimbabwe, where a lecturer and a peer trainee jointly observe a trainee's lesson and give constructive formative feedback nearing a clinical diagnosis, in South Africa and Sri Lanka, where teachers and trainers self-evaluate their performance through criteria of effectiveness, and in the Philippines, where teacher educators participated in syllabus review (Nyaumwe and Mtetwa, 2006, Peacock and Rawson, 2001, Zeegers, 2012). Although several studies highlighted the need for training teacher educators, the review did not identify many studies looking specifically at how teacher educators are trained, how they develop their own practice and PCK over time or how they develop a community of practice through collaboration in networks and individual and collective reflection, highlighting a visible research gap.

Continuing professional development

The majority of studies were on CPD (60%), suggesting a shift in focus and funding to professional development to support new reforms and pedagogies. Globally and in Latin America in particular, some studies reported a blurring between initial and CPD, starting with early immersion in the classroom at ITE and going on to include shorter follow-up CPD for newly qualified teachers (NQTs). This is exemplified by Mexico's Normal Schools or teacher training institutions which provide detailed teacher guides, new textbooks and classroom-based study in the first three years (Navarro and Verdisco, 2000, Schwille et al., 2007, Tatto et al., 2006). Field-based programmes of CPD are reported to be meeting the practical needs of teachers (Leu, 2004, Mattson, 2006, Orr et al., 2013). Findings on the effectiveness of CPD, however, remain inconclusive: while there is a shift towards

teachers' increased awareness and understanding of student-centred pedagogies or use of ICT, these practices are not always immediately implemented in classrooms.

The shift towards **school-based teacher development** sees innovative uses of ICT as particularly appropriate for rural areas, exemplified by the use of open educational resources, for example, from Teacher Education in Sub-Saharan Africa (TESSA), where teachers access self-study units adapted to the local context at school level, or in the Bridge IT projects in Latin America, where teachers use smartphones with wireless internet connectivity and data projectors to download and screen educational videos to support student learning or where mobile phones and MP3s are used as curriculum delivery platforms (Jara et al., 2012, Moon, 2007, Shohel and Banks, 2012, Thakrar et al., 2009). Despite positive teacher attitudes towards blended learning, it was not always successfully used, either because teachers were unable to access computers at all, or because they relied on the more mundane PowerPoint, as reported by Boitshwarelo (2009), Agyei and Voogt (2011) and Li and Walsh (2011).

Field-based models were organised around school clusters for meetings with trainers or mentors expert in particular pedagogies and with regular on-site professional support and use of detailed lesson observation schedules, often creating professional learning communities (Megahed et al., 2008, Rahman, 2011). In Eritrea, findings were 'impressive', with teachers engaging in dialogue with students, facilitated by interactive radio programmes, and in Uganda, with better understanding of curriculum goals (Brehance et al., 2007, Giordano, 2008). In Pakistan teachers were motivated by seeing the impact of their practices on their classes (Emerson et al., 2010).

Several studies report on **in-school innovations**. Many studies describe teachers who have been trained as **mentors, or resource or model teachers**, who return to their schools to provide in-class support, though results were mixed (Barrett et al., 2007, Courtney, 2007). Teachers in the study by Nga and Dinh (2008) in Vietnam found that such teachers created a warmer learning environment, particularly for girls. However Hardman et al. (2009) found that unless the key resource teachers (KRTs) were given time to train their peers in school, it simply did not take place. Similarly, new mentors remained tied to the textbook without being able to recommend improvement of practice to mentees in schools in Cambodia and China (Courtney, 2007, Han and Wang, 2010). Another innovation reported is **collaborative lesson planning** with university tutors or peers; this was seen as helpful in China (Moy and Peverly, 2005, Wang and Lu, 2012) and Pakistan (Khan, 2012, Mohammad and Harlech-Jones, 2008). However, the use of Japanese **lesson study** and peer coaching had mixed results across a range of settings (Ono and Ferreira, 2010, Thijs and van den Berg, 2002, Wang and Lu, 2012). Many studies described the positive use of **action research** to support an inquiry-based approach to teacher development, particularly in rural areas (Corcoran, 2008, Erawan, 2008, O'Sullivan, 2001a). However **reflective practice** had only limited success in Eritrea and Namibia as it encountered classroom obstacles which teachers attributed to students themselves (Belay et al., 2007, Pomuti et al., 2005, O'Sullivan, 2002b, 2004).

Training unqualified teachers

Orr et al. (2013) found that the most effective interventions to train large numbers of unqualified teachers remaining in post involved varying combinations of face-to-face workshops, classroom support and self-study, and in-school and cluster support. However, they warn that enhancing teachers' subject knowledge, particularly mathematics, remains more challenging in these ways, with written exams problematic as they provide no evidence of actual changes in practice. By contrast, programmes such as ABL, Gyan Shala and Schools for Life were more successful. They provided informal education for marginalised students and trained their unqualified local teachers over three weeks or so,

with further immediate and longer-term follow-up combined with refresher courses (Arkorful, 2012, CfBT, 2011, Coffey International, 2012, Zutshi, 2004).

Irrespective of whether studies looked at CPD, ITE, or training unqualified teachers, with few exceptions (e.g. Pryor et al., 2012), investigations of the effectiveness of training did not take a holistic view of pedagogy, that is measuring in a single study changes in teachers' attitudes and beliefs, their knowledge (both content and PCK) and their practices. Even here, students' learning outcomes as a result of ITE or CPD were often not obtained for reasons of scale and feasibility. Thus, evidence on the impact of training was only partially captured in most studies, highlighting a need for more holistic and robust evaluations of teacher education initiatives.

3.5 Summary of the thematic overview

Constructivism was the most frequently cited theory underpinning pedagogy, with active learning and more student-centred practices cited as the most-promoted pedagogies in national reforms and interventions. Practices described as student-centred included drawing on examples from the students' backgrounds, problem solving, use of TLMs, good interaction and relationships between student and teacher, and use of pair and group work. These practices were more often seen in secondary school, possibly because of smaller class sizes but here they were also constrained by high-stakes examinations. A common discourse used in reporting 'ineffective' pedagogies such as teacher-centred or rote learning was applied in generic terms and may not accurately describe the kind of strategies that were taking place, possibly presenting a more deficit picture than necessary.

In the 'ideal' form the promoted pedagogies matched Bernstein's (1975) competence model. However, in practice, a range of contextual, cultural and material constraints militated against teachers implementing them in the desired ways. Other barriers were related to pedagogy as ideas, where teachers' lack of subject knowledge was a key problem, specifically in language and mathematics as well as in new curriculum subjects such as environmental education. A second problem was teachers' resistance to change, attributed to ingrained cultural beliefs or difficulty in 'letting go' in order for students to learn more independently. There was also a superficial or narrow implementation of teaching and learning principles or curriculum. Teachers' deficit view of their students was seen as a barrier. Overall, the evidence on the effectiveness of learner-centred pedagogies is mixed, although the number of studies reporting positive findings slightly outnumbered those reporting negative findings.

Very few studies reported on successful practices using structured pedagogy and direct instruction. Although some studies reported on a small number of effective interventions based on structured pedagogy with marginalised poor and rural children, these interventions need to be evaluated more rigorously. Likewise, potentially effective pedagogies and curriculum and learning materials development were reported in a small number of studies which would benefit from robust empirical research.

Recent curriculum models suggest a shift from content-driven curricula to outcomes- and competency-based and thematic or integrated curricula which are more aligned to the promoted pedagogies. These reforms are, however, not always successful in meeting their goals. They can be overloaded, fragmented, exclusive and irrelevant. Without realistic support and scaffolding for learning, teachers are likely to implement the curriculum only partially and default to traditional methods for much classroom activity. A few studies also reported on localised and accelerated curricula. Attempts to indigenise or localise curricula for greater relevance have met with both positive and negative outcomes. Teachers are often not consulted in curriculum design; equally, parents may not accept the assumptions of the curriculum, posing a challenge for teachers attempting to

implement it. There is a frequent mismatch between curriculum aims and mode of assessment, which produces contradiction in reforms.

Teacher education was reported as both a facilitator and a barrier to achieving the implementation of promoted pedagogies. Traditional front-loaded ITE, whereby trainees learn content and methods in a residential setting prior to the practicum in schools, looks outdated in comparison to the field-based models of CPD which more successfully integrate theory with teachers' actual classroom practice. ICT offers the potential to develop creative pedagogies, particularly in terms of providing richer learning materials. Short, intensive training courses for unqualified teachers have the kind of follow-up support that is missing in ITE. There are mixed results, however for CPD programmes. Many studies found that teachers had changed their attitudes or adopted more positive attitudes as the result of training or interventions and had developed into more critical, reflective professionals. However, the evidence on the impact of training on pedagogic practice was only partially captured in most studies, as they failed to adopt a holistic view of pedagogy, measuring changes in teachers' attitudes and beliefs, their knowledge (both content and PCK) and their practices in a single study. Furthermore, with few exceptions, the reviewed literature seldom measured student outcomes as an indicator of the success of pedagogical, curricular or teacher education interventions or reforms.

4. What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?

4.1 Methodology for the in depth stage: quality assessment of included studies

In addition to the inclusion criteria applied to references for the thematic overview (see Section 3.1), studies had to meet the following criteria to be included in the in-depth review:

B1. Must be an empirical study

Theoretical papers were excluded from the in-depth review, which focused on empirical data. Quantitative, qualitative and mixed methods were all included, as all could contribute to answering the research questions.

B2. Must report on more than six schools

While the fine-grained detail provided by an in-depth study of a single school can provide important insights, our task was to review the field of pedagogy across developing countries and to reach conclusions that would have broad application, so a minimum sample size was set for studies reaching the in-depth review. Six was chosen on the basis of experience from other reviews (Orr et al., 2013), which indicates that this limit does not exclude high-quality qualitative research, such as that focusing on school ‘clusters’. Studies with smaller numbers were included within the thematic overview but not the in-depth review, although we deviated from this with three studies which had slightly fewer than six schools but significant numbers of respondents and additionally were on under-researched aspects.

B3. Must describe the pedagogy used and any outcomes in enough detail that its component elements can be identified

These component elements would include details of at least some of methods, teacher discourse, class management, student participation, teaching and learning resources, and assessment. Some papers gave only a project title or pedagogic label, without providing any description of how the pedagogy was actually implemented, or was meant to be implemented. Where such information was not given, it was not possible to draw evidence-based conclusions about the pedagogy under discussion, and so such studies were not included in the in-depth review.

B4. Must report on how data were gathered and on whether any attempt was made to guard against bias

It would not have been possible to carry out full methodological quality assessment of all 489 studies considered for the in-depth review. However, this inclusion criterion considered the *reporting* of methods, screening out studies that said little or nothing about their own data collection and/or measures. Where such information was not given, it was not possible to make evidence-based judgements on methodological quality one way or the other, because of the lack of information.

B5. Must focus on education in a low- or lower-middle-income country

Low- and lower-middle-income countries were selected as priority settings for the review, to reflect level of need and aid flow priorities. It is recognised that regional income variation within countries may sometimes be as stark as variation between them; however, it was beyond the scope of this review to consider distinctions on this scale.

Studies which did not meet all five criteria were excluded from the in-depth review (see Figure 2.1 for numbers).

Those studies which met the inclusion criteria for in-depth review were then subjected to quality assessment, using a data extraction tool adapted from the EPPI-Centre's template.¹ This assessed each study on a number of aspects (see Appendix 5 for the full tool), which then informed an overall judgement, rating it Low, Moderate or High on two dimensions:

- **Methodological rigour** (clarity of reporting; how the evidence was collected and analysed, including whether or not the trustworthiness/reliability and validity of the tools, methods and analysis had been addressed; fit between findings and conclusions); and
- **Quality of contextual detail given** (including the detail of educational setting, teacher background, qualifications, training, material conditions of classrooms, details of factors facilitating change/success, barriers to change/success).

It was important to take into account both of these dimensions when assessing which studies contributed to our knowledge of pedagogies. While the first - methodological rigour - was vital to enable judgements about the strength of evidence for the findings presented, the second - quality of contextual detail - provided information about the conditions under which pedagogies were found to be effective or not. Without such detail, one is left with decontextualised findings and it is difficult to know what conditions contribute to the outcomes described, and hence to work towards generalisations, replication or up-scaling. Because of the huge geographical reach of this review, this is particularly important; it may not be much help to find that the evidence strongly suggests that a given pedagogic practice is effective in Guatemalan schools, for example, if nothing is known about the conditions that might or might not make that evidence transferable to Ethiopian schools.

Fifteen per cent of studies from the in-depth review were rated independently by two team members to ensure consistency; all disagreements were reviewed by other team members. Conflicts of interest were addressed by ensuring that authors of studies were not involved in screening or data extracting any study with which they had been associated.

As was to be expected when exploring such a wide field, the quantitative studies identified for the in-depth review were not sufficiently similar to permit comparison using meta-analytic methods. Narrative synthesis was therefore employed to bring together the findings of the qualitative and quantitative studies selected. The synthesis discusses the evidence - and necessary conditions - for effectiveness of the principal pedagogic practices identified in this literature. The underpinning findings informing this synthesis are summarised in tabular form in Appendices 6 and 7.

A total of 62 reports were included based on 54 empirical studies in the final in depth analysis stage in order to answer the second research question. As presented in Table 4.1, the studies came from a range of countries, with sub-Saharan Africa (particularly Ghana, Tanzania and Uganda) predominating (29 studies), followed by India (15 studies). There was some recognition of equity issues: studies generally indicated whether the students were from rural or urban areas, some studies from India indicated where students were specifically identified as belonging to Scheduled Castes, and two studies identified the issue of students with a disability. Most interventions specifically targeted marginalised students, including girls, in very rural and difficult to reach areas, such as northern Ghana

¹ See <http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=184#Guidelines>.

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for Schools for Life, or poorer children in Tamil Nadu, or those from ethnic, linguistic or religious minorities in Cambodia and Lao PDR. The majority of the studies on reforms or existing conditions looked at the rural poor. However, few studies reported the socio-economic backgrounds of the students in much detail.

Table 4.1: Number of in-depth studies by country

Region/country	No. of studies
Africa	
Sub-Saharan Africa	
Kenya	5
Uganda	6
Tanzania	5
Malawi	1
Swaziland	1
Lesotho	1
Ghana	6
Senegal	1
Mali	1
Nigeria	1
Benin	1
North Africa	
Egypt	1
Asia	
South Asia	
India	15
Pakistan	2
Bangladesh	3
Sri Lanka	1
East Asia	
Lao PDR	2
Cambodia	1
Burma	1
Central Asia	
Kyrgyzstan	1

Note: Multiple countries are possible

The qualifications of the teachers were varied, as is to be expected in low- and lower-middle-income countries. The majority of studies reported that teachers were qualified (n=23), with five on unqualified teachers and eight a mix of qualified and unqualified teachers. Six studies focused on student teachers, and seven on teacher educators. The studies did not always give details on what kind of qualification teachers had, whether a diploma or university degree, nor whether unqualified teachers were well-educated or under-educated (Orr et al., 2012). This lack of detail is identified as a research gap. Nine studies did not specify whether teachers were qualified or not, or to what level, or their degree of experience. As such, it is difficult to analyse whether more experienced teachers were those more likely to pay attention to their learners and less experienced teachers least likely to.

In drawing conclusions from the review's findings, studies scoring High or Moderate on both dimensions were prioritised, while studies that scored Low on either dimension had little influence on the synthesis. The studies included in the in-depth review have additionally been classified as of three types. 'Intervention' studies are those which address pedagogic practices within the context of a specific project or attempt to improve schooling in a particular location through means such as funding, training or providing material resources. These are often studies that seek to evaluate the intervention. 'Reform' refers to studies that take place in the context of large-scale reform, mostly of national curricula, and therefore, as with interventions, there is likely to be an indication of the desired practices to be produced by the reform. 'Existing conditions' refers to exploratory research which is describing and analysing what is going on in a location, where interventions or reforms are not highlighted by the study. Identifying studies as intervention, reform or existing conditions was helpful in understanding the material conditions in which practices were implemented and their relationship to a given curriculum and forms of teacher education. These were often seen as a 'package' of inputs in interventions, but were rather more distantly related to pedagogic practices in reforms and existing conditions. The 45 studies consist of 17 interventions (Int), 5 reforms (R) and 23 reported on existing conditions (EC). Some of the last category are also classified as Obs(ervation) A(nalytical) or D(escriptive). The individual quality of each study with respect to the research question is indicated by H for High and M for Moderate weight of evidence, with methodological rigour first and contextual robustness second, followed by the type of study, for example 'Leach, 2004 H/H Int'.

It was noted, however, that studies of interventions, particularly evaluations, were more likely to claim pedagogies as more effective if that was their focus and were less likely to report wholly unsuccessful interventions. This may in part be due to these interventions receiving more support through funding and stakeholder time. It may also be because study authors were intentionally close to the intervention design and evaluation, e.g., Hussain (2010). Conversely, national curriculum reforms promoting a specific pedagogic approach may also be supported by increased government funding and planned implementation, but they report more often a mixed set of results. This may be because the authors are more likely to be external to the reform and may have a more critical stance of such wide scale reform, e.g., Hardman et al. (2012). The scale of the reform itself also mitigates against the more positive results obtained through a smaller intervention. Authors' transparency with regard to their relationship to the intervention has informed decisions around the quality assessments of studies.

To support further analysis at this stage, studies rated as High and Moderate were categorised according to whether the pedagogic practices were reported as having wholly or almost always positive outcomes (n=12), whether the findings were mixed, with some practices reporting mixed outcomes (n=17), or whether they reported mostly negative outcomes (n=16). This further categorisation also imposed an organising structure on what was a large number of diverse studies.

4.2 What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?

As pointed out earlier, a key issue is that studies described pedagogic approaches as ‘student-centred’, ‘child-centred’ or ‘active learning’ but without details of actual practices, with the assumption that these terms were stable and the reader would know what they meant. Consequently, their utility for this review was minimal. Where specific practices were described, such as those identified earlier in the narrative overview, for example group work or problem solving, this was usually very general, so that it was not clear what teachers did well or not, hence the inclusion criteria for studies included in the in-depth review to have enough detail to answer this second question. Alexander stresses the importance of gathering accurate and full accounts of pedagogic practices to support rather than ‘misdirect’ policy makers, and to avoid wastage of resources on poorly evidenced interventions (Alexander 2008, p.39). This review has tried to do just that, uncovering assumptions behind the terms and labels used to describe different pedagogies.

The review’s main finding is that teachers’ positive attitudes towards their training and their students is important, but it is when teachers see pedagogy as a kind of communication with students that their teaching practices become meaningful, leading to positive outcomes for their students. Three strategies have been identified from a number of studies that prioritised communication with students and were inclusive in nature. Those three strategies are: teachers giving feedback and paying sustained and inclusive attention to all students; creating an environment where students feel safe; and teachers drawing on students’ backgrounds in their pedagogic discourse.

These strategies lead to teachers using six practices in a communicative way, identified from one or more study and associated with positive outcomes:

- demonstration, explanation drawing on sound pedagogical content knowledge;
- flexible use of whole-class, group and pair work where students discuss a shared task;
- frequent and relevant use of learning materials beyond the textbook;
- open and closed questioning, expanding responses, encouraging student questioning;
- use of local languages and code switching;
- planning and varying lesson sequences.

These six practices are not presented here as a prescriptive list, but are a synthesis of the most common practices reported as having positive outcomes, and were used in isolation or more often in various combinations and sequences. While these indicate teachers’ understanding of social constructivist theories of learning, teachers used in practice a judicious combination of both student- and teacher-centred pedagogical practices, integrating newer pedagogies with more traditional ones. Those practices, such as interactive group and pair work, encouraging student questioning, use of local languages and code switching, are seen within what is termed ‘student-centred’, ‘learner-centred’ or ‘active methods’, but the other practices which were also seen to have positive outcomes, such as dialogue involving the whole class, demonstration and teacher questioning, are also found within ‘teacher-centred’ pedagogies, although they might better be termed ‘teacher-led’ or ‘direct instruction’, carrying less pejorative connotations.

As can be seen from Figure 54.1, the evidence comes from studies not only of interventions but also of reforms and existing conditions, so that these practices also developed under generally difficult conditions, with large, multilingual classes and scarce resources, sometimes by unqualified or underqualified teachers, and where students overwhelmingly came from poor or marginalised backgrounds. Only three interventions provided extra or tailor-made resources, with classes smaller in ABL programmes, but the SfL programme did not have the ample resources of ABL and yet was effective in promoting learning. These practices therefore indicate what is possible and therefore often practical under less than optimal conditions and where the real potential is to improve students' learning under the challenging conditions that are commonplace and likely to continue at least for the next five to ten years in developing countries.

These can also be viewed as 'child-friendly' in essence, and match those child-friendly indicators used by Bhattacharjea et al. (2011) in their study. Writers in this review come to similar conclusions: Altinyelken (2010) indicates Ugandan teachers' 'pedagogic palette'; Vavrus and Bartlett (2012) write of 'contingent constructivism'; Sriprakash (2009, p.640) concludes that teachers have to 'negotiate their way through the mixes and layers brought by pedagogic reform; and Dembélé's (2005) comments that there is room for both student- and teacher-centred approaches. These pedagogic strategies and practices identified have no specific label, although Croft's 'learning-centred' (2002) may be nearest and they might be encompassed by Alexander's term 'dialogic' (2001). Building on the discussion from the conceptual framework, in Bernstein (1975)'s terms the practices come under a performance model, led by the teacher, who remains an authoritative figure, with strong framing of lessons, visible pedagogies and collective ways of behaving and standardised outcomes, but informed by a competence model where students' needs are responded to by the teacher. It is this competence model that is, however, the most significant and best relates to the three communicative strategies.

Significantly, these practices, stripped of the positive adjectives used in their descriptions above, could also be implemented poorly with negative outcomes. Highly rated studies reported that teachers used the same six practices, such as demonstration, group work, questioning and learning materials, devoid of the communication element, where demonstrations, for example, were simply lectures or reciting from a textbook, or where groups were too large, so that students sat together but worked independently. Thus the findings suggest that the crucial difference in the way teachers practice is not **what** is done, but **how** it is done, and this is shaped by how teachers understand the teaching and learning process, seen in those three strategies which prioritise communication with students. Even where outcomes were mixed, the evidence showed that teachers were trying to implement more student-centred practices and often 'failing' where conditions made it impossible for them to fully succeed. Group work, for example, is difficult to do even in well-resourced, smaller monolingual classes with well-educated teachers in developed countries, requiring training, time and careful modelling of talk (Rojas-Drummond and Mercer, 2004). Table 4.1 summarises the findings, with the numbers of studies that reported the pedagogic aspect in brackets and the number of studies reporting higher student attainment as an outcome following the forward slash.

Table 4.1 Summaries of teacher attitudes, strategies and practices

Pedagogic aspect		Positive examples (number of studies)	Negative examples (number of studies)
Attitudes	Training and Pedagogy	Harmonisation between culture, training, pedagogy and classroom contexts makes teachers positive towards new practices (4/2)	Constructions of the teacher as authoritarian prevent understanding of interactive practices (8)

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Pedagogic aspect		Positive examples (number of studies)	Negative examples (number of studies)
	Students	Positive attitudes towards poor and marginalised students lead to awareness of students' backgrounds, experiences and abilities (6/1)	
Strategies	Paying attention	Tailoring instruction to specific students, giving tests, homework, constructive feedback, including all students in lesson content and discourse (7/4)	Groups of students ignored, especially students with disabilities in large classrooms (6)
	Classroom Environment	Lively, warm and friendly teachers encourage participation. Absence of corporal punishment makes students feel safe (6/2)	
	Student characteristics	Students' backgrounds, prior knowledge and local examples drawn upon to make lesson content relevant and meaningful (5/1)	Lesson content overly abstract and irrelevant for students (2)
Practices	Group work	Verbal interaction in small mixed or ability groups, sharing tasks and resources, monitored by the teacher (15/4)	Permanent rows, little peer interaction, active zone of students at front do best (5)
	Learning materials	Variety of materials used with textbook, from MP3s to stones, integrated with prior knowledge and concept formation (9/5)	Prescriptive and use solely of difficult textbooks, copying from board (7)
	Use of questions	Open and closed, expanding and probing responses, encouraging student questioning (10/4)	Frequent closed questions, choral responses, one word answers (7)
	Demonstration	Imaginative, interactive demonstrations and explanations using voice, students, images, based on sound content and pedagogical content knowledge (8/1)	Didactic lecturing, poor content knowledge (13)
	Language	Use of local language gives access to lesson content and encourages verbal interaction (9/3)	Unfamiliar language leads to rote learning and incomprehension (3)
	Lesson structure	Planned lessons lead to varied sequences of methods and tasks (11/3)	Predictable teaching sequence limits variety of activities (15)

However, seeing pedagogy as necessitating communication makes heavy demands on teachers. They are unlikely to continue to make such an effort unless they see it as being to some purpose and valued. The impact of what they are doing is therefore crucial and needs to be visible and perceptible to them, to the students and to stakeholders. Those teachers who used communicative strategies were more likely to see a visible change in their students as they grasped the lesson content, evident through listening to student responses, to their questions, to their discussions, to assessing written work, to their physical nods and gestures or practice at the board. However, other less directly visible successful outcomes of teachers' practices, such as good results in class and school-level tests, remain the most valued measure of pedagogic effectiveness, as do national high-stakes examinations or gaining the approval of members of their community. Thus, as illustrated in the conceptual framework, pedagogic practice is developed through interaction between teachers' thinking or attitudes, what they do in the classroom and what they see as the outcome of their practice.

4.3 How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

The pedagogic practices as outlined above were supported by four particular factors pertaining to teacher education and curriculum, as indicated in the conceptual framework:

- professional development aligned with teachers' needs, applied in context with follow-up support;
- teacher peer support;
- support from the head teacher;
- the school curriculum pitched appropriately, with accessible content, not overloaded and where assessment is aligned with its content.

Conversely, there were five barriers that prevented teachers from implementing effective practice, often the inverse of those favourable factors: misalignment of initial teacher training with school curriculum; misalignment of continuing professional development with the promoted pedagogy; limited resources and large class sizes; curriculum and assessment; and poor communication with the community and policymakers. These are summarised in Table 4.2:

Table 4.2 Summary of enabling and disabling factors for teacher education, support and curriculum

Facilitating factors		Enabling factors (number of studies)	Disabling factors (number of studies)
Teacher education	ITE and CPD	Alignment with teachers' needs, school curriculum and specific pedagogic practices designed for particular contexts and types of learners (e.g. ABL, SfL) (5/2)	Misalignment between the ITE or CPD curriculum and teaching methods with the school curriculum, students and classroom realities (6)
	Resources	Teacher manuals with scripted lessons (3/3)	
	Teacher educators	Retrained, expert teacher educators who understand, model and teach the	Outdated, irrelevant experience; expository methods used to teach prescriptive

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		promoted practices (2/1)	teaching sequences (3)
Support	In-class practice and support	Regular in-class support and lesson modelling by teacher educators/mentors who give constructive feedback (6/2)	Short ITE practicum with little guidance, distance between college and schools; no practical application of methods learnt on CPD (3)
	Peer support	Formal and informal peer support in clusters or schools allows teachers to do joint observations, share resources, lesson plans and assessment practices (8/2)	
	Head teacher and community	Head teacher and community awareness and support for teachers and new methods of teaching (4/1)	Lack of awareness or participation in interventions or curriculum reform by parents, school management committees or community members (10)
Curriculum	Content and coverage	Pitched appropriately, with accessible content focused on literacy and numeracy (2)	Irrelevant to rural or marginalised children, pitched towards highest achievers, overloaded, inflexible (3)
	Assessment	Alignment between curriculum content and modes of assessment, often continuous assessment (3/2)	High-stakes summative examinations compelled teachers to quickly cover the curriculum using teacher-directed methods (4)
	New subjects		Continuous assessment, life skills, teaching multigrade classrooms or working with disabled students neglected in CPD (3)
	Textbooks		Limited numbers of textbooks and teaching and learning materials and of poor quality (18)
	Student numbers		Large student numbers, immovable desks, high noise levels for group work, little time to mark work (13)

4.4 Theory of change

A theory of change should ideally show the steps of an intervention, its precise goals, the causal mechanisms by which change should occur, and the assumptions underlying each stage. However, our research questions have an unusually wide scope and range of application (schools in all low- and middle-income countries across the world). Any attempt at a thoroughly comprehensive theory of change in diagram form for each of the practices and interventions we cover would, as a consequence, take up several pages and be unhelpfully complex. We have therefore opted to show the general stages and

assumptions in the diagram (Figure 4.1), and to explain these more fully in the accompanying explanatory sections of the text.

We have, however, indicated the strength of the evidence against each practice by putting the numbers of the studies in brackets and indicating where the evidence from these is **weakest by putting this in red**, where the evidence is **moderate by amber** and where the **evidence is stronger but still within the moderate category in green**.

The central lozenge (in blue) represents the three-way relationship between positive teacher attitudes and the three communicative strategies, and the impact these have on how teachers implement the six teaching practices. These attitudes and practices mutually reinforce one another as represented by the horizontal double-headed arrow. Because these teachers are attuned to all their students' learning, they see the visible impact of this learning in the classroom and this becomes part of that mutually reinforcing cycle, represented by the double-headed arrow in between teacher practices and impact on student learning, represented by the bottom lozenge in green. Equitable student learning is the purpose of teaching, seen in the greater engagement and enjoyment of lessons by students, including the most marginalised, but also, and ultimately, in higher student attainment and greater stakeholder satisfaction. The assumptions are, however, that students are able and motivated to learn from these practices in terms of health, nutrition and cognitive development and that there are sufficient learning materials for teachers to use.

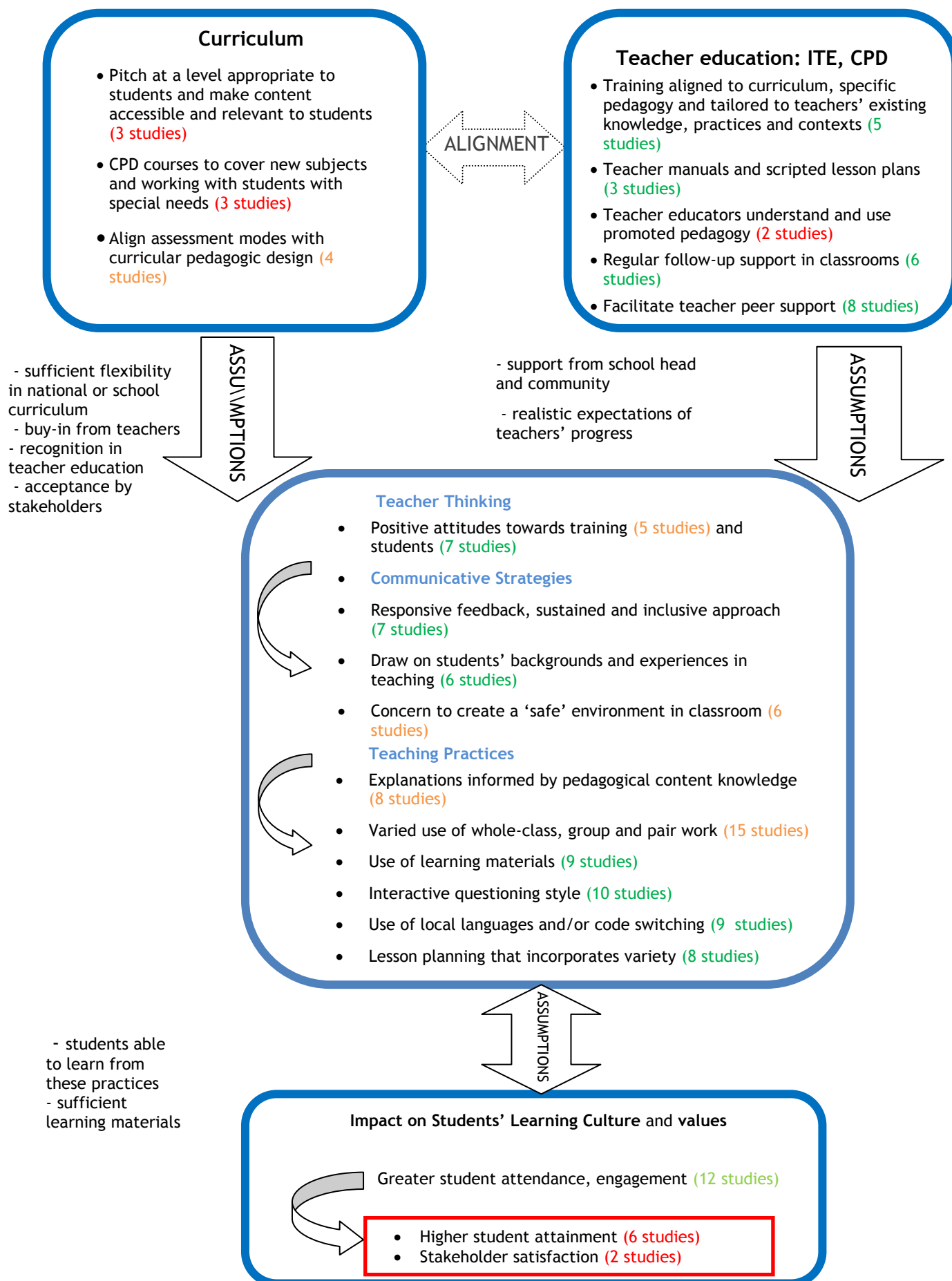
The ways in which curriculum and teacher education best support effective teaching practices is indicated in the top two lozenges with the dotted double-headed arrow in between them indicating that under optimal conditions these two should be aligned with one another. The main alignment is that teacher education recognises, and teaches to, the school curriculum.

The curriculum needs to be appropriately pitched, accessible and not overloaded, and assessment modes need to be aligned to pedagogic design. Any CPD needs to ensure full coverage of the curriculum, including the newer subjects, such as health education and life skills, and to ensure differentiation for students with special needs. For this curriculum to be so designed and then implemented by teachers using the effective strategies and practices outlined above, the assumptions are that there is sufficient flexibility in national and school curriculum for such change, that there is buy-in from the teachers in terms of their acceptance and understanding of the new curriculum, that it is recognised within teacher education and accepted and understood by a range of stakeholders, including head teachers, school management committees, the wider community and parents.

In turn, teacher education, both ITE and CPD, need to be aligned to the curriculum and classroom realities, be they large classes of over 100 and few learning materials, or smaller classes with textbooks for all. Teacher education programmes need to be tailored to teachers' existing knowledge, practices and circumstances, so that learning relates to their classrooms and to the pedagogy they are to teach. Teachers need opportunities for concrete application of newly acquired skills, helped in this transition by teacher manuals and scripted lesson plans. In turn, teacher educators themselves need to have recent and relevant experience of current school curriculum and pedagogies, to understand them and to use them in their own teaching. Teachers then need to have regular follow-up support via classroom observation, coaching and feedback. Finally, peer support among teachers embeds this model of teacher learning sustainably over a longer time period. For this model of teacher education to work, however, the assumptions are that there is support from the school head and community, and that expectations for teachers' progress are realistic, taking place over time rather than immediately.

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Figure 4.1 Theory of Change



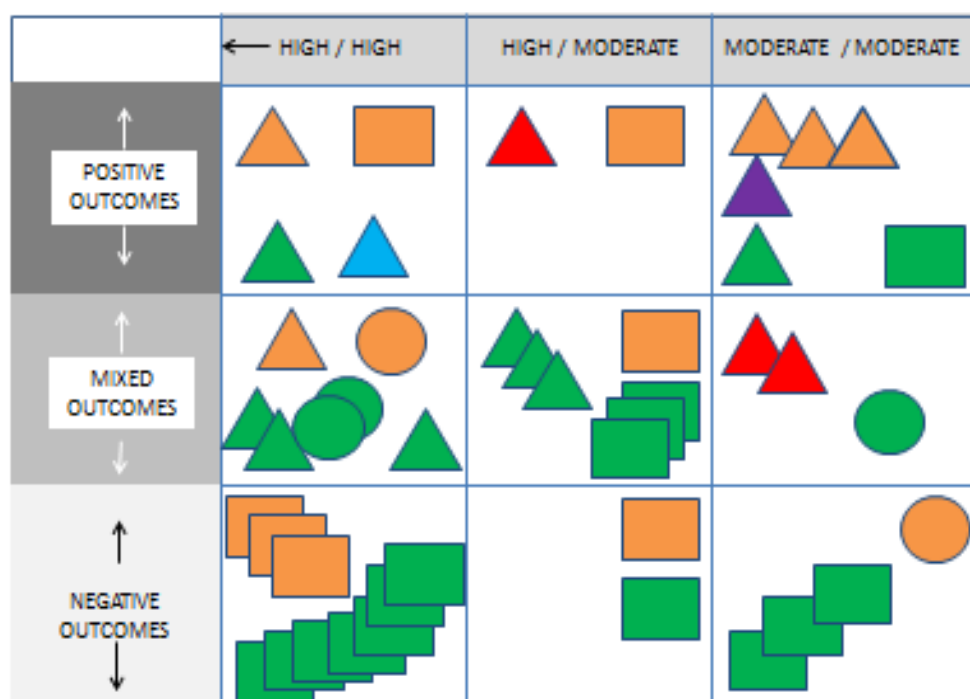
4.5 Strength and nature of the body of evidence for effective pedagogical practices

The overall strength of the body of evidence for the review findings is moderate, albeit uneven, with some more robust evidence, in particular areas such as consistency of findings in the way that teachers implement the six practices identified, aligning CPD with the curriculum and pedagogy, the positive impact of follow-up class support and peer support, and some weaker areas such as correlating the practices with student learning outcomes. The evidence itself consists of a combination of high and moderate quality studies from a range of contexts, relatively numerous in relation to other rigorous and systematic reviews. The majority of included studies were observational-descriptive and provided the level of detail of pedagogic practices needed in such a review as this, sometimes lost in more quantitative research designs. However, this also meant that studies were not directly comparable, with different aims and research methods and a variety of outcomes to demonstrate ‘effectiveness’: increase in student achievement, attendance, engagement and enjoyment; stakeholder satisfaction; and the extent to which teachers used the promoted pedagogy. Only six studies give specific measurements of student learning and very few use baseline and post-intervention data. Only three correlated pedagogic practices with student achievement but with few details of pedagogical practices (Aslam and Kingdon 2011 H/M Obs-A EC; Bhattacharjea et al. 2011 H/H EC; Nannyonjo 2007 M/M Obs-A EC). Thus, this review acknowledges the measures, proxies or indicators advocated by the intervention or reform as ‘effective’ in the study itself, in order to broaden the range of studies included, recognising the difficulties involved in getting accurate measures of the impact of practices.

Figure 4.2 illustrates the distribution of studies assessed as high or moderate in quality and in relation to: whether studies reported pedagogic practices with mostly positive outcomes, mixed outcomes and negative outcomes; according to type of study, whether intervention, reform or existing conditions; and regions. The four studies rated highest in quality with the most positive outcomes, seen in the top left-hand square, were three interventions and one describing existing conditions: Arkorful, 2012 in Ghana; Leach 2004 in Egypt; Saigal 2012 and Sharma 2013, both in India. Seven studies reporting mixed outcomes were themselves a mixture of interventions and reforms. Ten studies reporting negative outcomes were all on existing conditions, the great majority of which were from sub-Saharan Africa.

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Figure 4.2: Distribution of studies in in-depth review by region and type, according to quality of study and reported effectiveness of practices



Key to symbols

REGIONS by colour

Sub-Saharan Africa



South Asia



East Asia and Pacific



North Africa and Middle East



Central Asia



TYPE OF PROGRAMME by shape

Intervention



Reform



Existing Conditions



Before looking in detail at each positive strategy and practice as described in all the high and moderately rated studies combined, the following section looks at each of the highest rated studies reporting positive and mixed outcomes individually to understand ‘what

works' within very different studies and contexts and also to illustrate the observational-descriptive methodology used by the majority of studies. These 11 studies are rated the highest according to the two weights of evidence. Observational-descriptive approaches are used in all of these studies, with the frequent combination of interviews and observation, and with the larger studies by NCERT and Coffey International, complex systems of measuring and coding qualitative data are used in order to increase rigour and validity. However, a variety of outcomes are used to demonstrate, indicate or measure the impact of the practices. Details of all the studies can be seen in Appendix 8.

Four highest rated studies with positive outcomes

Arkorful's 2012 study of an intervention in northern Ghana used stratified random sampling to identify 10 Schools for Life (SfL) and two formal primary schools to carry out a largely observational-descriptive approach using documentary analysis of curriculum materials, semi-structured interviews with SfL staff, teachers parents, SfL graduates and management committee members, and structured classroom observations in four schools as well as participatory rural appraisal methods with SfL students. The SfL functional and locally relevant curriculum focuses on literacy and numeracy, taught in the local language, and uses student-centred activities in which aspects of students' backgrounds are drawn upon. SfL provides scripted curriculum materials to the locally recruited and unqualified teachers, who received initial and then on-going training. Arkorful compared the student test scores in literacy and mathematics of 150 SfL graduates mainstreamed into primary schools with their 237 peers via National Education Assessment standardised tests in primary 4 and 6. Little difference was found between the two groups, despite SfL graduates having only nine months of accelerated learning for three hours every afternoon rather than three years of formal school, being overage and having to learn in English for the first time. However, there was no assessment of students at the end of the SfL itself and it is therefore not easy to correlate SfL practices to student learning outcomes. Some 26,250 students have benefitted so far from SfL, with 22,000 transitioning into the formal education sector.

Leach's 2004 intervention study in Egypt and South Africa developed the use of handheld computers and pocket cameras in 48 teachers' practices in 12 primary schools in each country and two teachers in each school. Schools were selected from 91 expressions of interest, according to whether the school principal endorsed the project and whether teachers were motivated. Nine of the twelve schools selected were without any form of ICT, 50% without telephony and one-third without electricity. A range of qualitative methods were used including questionnaires, diaries, interviews, classroom observations (including video) and teachers' concept maps. Specially devised professional development programmes enabled teachers to integrate a range of ICT-enhanced activities into their teaching of literacy, numeracy and science, supported by school visits and a range of multimedia resources. A total of 74% of teachers reported that their use of ICT facilitated collaborative ways of working, 54% that they had better ways to present materials and 31% that ICT enabled independent learning. While the range of qualitative methods provided ample evidence, increased student achievement levels in literacy and science were only reported rather than measured, as was increased student attendance and stakeholder satisfaction.

The next two studies are smaller in scope, the first focusing on in-class support and the second on the beliefs and practices of five teachers considered by researchers to be the best, without training or intervention, both from India.

Saigal's 2012 intervention study on six schools and 14 teachers in India examined how the Quality Education Programme (QEP) processes of teacher professional development were being experienced in Baran schools three years after the programme was introduced. A multiple case study approach was used, employing participant observations, in-depth

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interviews, informal discussions and secondary sources, with inductive analysis taken across school cases. The QEP intervention used specialist advisers to work directly in class, modelling alternative strategies and helping with concrete practices. This was on a frequent basis, with teachers meeting up every month. Teachers used more student-centred practices and withheld corporal punishment.

Sharma's 2013 study in India is not an intervention but presents five case studies in existing conditions that detail the beliefs and practices of effective teachers from a larger sample from 10 different government schools serving students from poor unskilled labourers' families. Detailed observations of classroom practice and in-depth unstructured interviews with thematic analysis were used. These 'good' teachers, typologised as either Companion, Instructor, Mother Teacher, Guide or Guru, knew much about the lives of the poor children they taught, in classes from 25 to 45 students, were aware of the inequalities of caste and gender and sought to alter these in their practice. These teachers hooked children into lessons, used additional materials apart from the textbook and used discussion as a pedagogic practice, asking higher order questions to stimulate critical reasoning and curiosity. Teachers avoided scolding and did not use corporal punishment.

Seven highest rated studies with mixed outcomes

Interventions do not guarantee positive outcomes: in the following studies that reported mixed outcomes (illustrated by the left middle square of Figure 4.2) there are four interventions and three studies of national curriculum reforms where alignment between teacher education, the curriculum and teachers' practices was not so close and funding for resources was less than adequate. These studies identified some positive outcomes but also reported on what did not work and why, and hence have mixed outcomes.

The study by Hardman et al (2009) evaluated Kenya's national School-Based Teacher Development and Instructional Materials intervention project (SbTD), which focused on active learning and textbooks through distance education, with three key resource teachers (KRTs) trained in each school and reaching 47,000 teachers. The study used semi-structured interviews with students, teachers, head teachers and parents, 102 in total, and videoed 144 lessons in 24 schools representative of the country, using discourse analysis. This produced detailed evidence of the KRTs' more interactive questioning style, more frequent group work and equitable learning for boys and girls, facilitated by use of L1 and code switching and constructive feedback. Particularly helpful were in-school and in-class support, regular meetings and teacher study guides. Students' attainment improved according to data from primary leaving exams but there was a time lag and other factors other than the SbTD could have impacted on student scores. Even so, lecturing and reading from the board remained the dominant discourse, particularly for those teachers who did not benefit from the direct training and where the time and workload prevented the KRTs from cascading their training down to them; headteachers needed to take the lead on pedagogic change. This was a large-scale national intervention, however, which may explain the mixed outcomes and indicates what is possible and where the barriers lie.

The National Council of Educational Research and Training (NCERT) 2011 evaluation of Activity Based Learning programme in Tamil Nadu was of a similar large scale: the intervention reached some 37,500 schools, and the study involved 280 randomly sampled schools from 15 districts. ABL is part of the wider national reform of Sarva Shiksha Abhiyan (SSA), India's version of Education For All, backed up by the recent 2009 Right to Education policy. In ABL, the curriculum is organised via groups of competences, and children move at their own pace along bespoke learning ladders but sit in groups, with ample learning materials, supported by a teacher monitoring individuals and groups. The evaluation was a mixed methods design, using interviews, observations, questionnaires

and focus group discussions, but there was no baseline data available to monitor/track progression so

a non-equivalent control group design was used to assess the impact of the ABL programme on student achievement. In the absence of an independent comparison group the students who were exposed to the programme for a longer duration (phases I and II) were compared to students exposed for a shorter duration (phases III and IV), with the assumption that longer exposure to the programme would result in higher performance from students' (p.ix).

Descriptive and inferential statistical techniques were used to analyse the data, including three composite scores considered as dependent variables: ABL implementation, classroom practices and teacher behaviour score. Qualitative data were cross coded, themed and compared. Results showed that the specific training of teachers greatly supported their effective use of the learning materials and monitoring of students, with students happy to learn and higher results achieved, although it was unclear whether it was the students' SES backgrounds or the ABL practices themselves that were a cause of the high scores. However, attendance at training was not always 100%, there was some poor use of resources with some teachers having to purchase their own, some drilling and repetition, and parents and community having little awareness of ABL methodology.

Coffey International's 2012 study looked at the characteristics of Activity-Based Learning (ABL) as it is being used in Ghana, to justify its scaling up or the incorporation of successful characteristics into formal early basic education. The study used interviews and focus group discussions in Phase 1 in 30 schools, leading to categorisations of schools using quantifiable codes as 'latent', 'emerging', 'established' and 'advanced'. Phase 2 drew on observations and student assessments in 30 schools, included looking at early childhood contexts and Schools for Life. A non-randomised sampling technique was used for Phase 1 and a purposive critical case sampling approach in Phase 2. The objective was to adopt a quasi-experimental approach involving ABL intervention and control sites with a random sampling of ten students per class for tests. Respondents totalled 181 teachers, 900 randomly selected pupils, 23 head teachers, 24 Ministry and Development Partner representatives and 18 purposively selected representatives of the Colleges of Education. Regression analysis was conducted to determine the relationships between key variables. The results indicated that ABL was at a latent stage, with teachers circulating around class, students more on task and asking questions, with teacher feedback, and there were increases in students' outcomes in English and mathematics scores in the ABL intervention schools. However, ABL methods were integrated with more traditional methods, hampered by few TLMs, little individual attention, poor head teacher support and lack of parental support for ABL methods in ABL intervention schools. The holistic support for ABL seen in the NCERT evaluation above was missing in Ghana, with researchers stressing the need for teachers to experience ABL for themselves and to see its impact on students.

Clarke's 2003 study of a reform was also in India, and explored the new child-centred national curriculum introduced in 2006, as part of the District Primary Education Programme (DPEP). The study looked at the intensive ten-day training and in-class support, and monthly teacher meetings at cluster level. Clarke used observations and interviews with a random sample of 234 teachers, 50% of whose students were Dalits or from Scheduled Tribes. Quantitative inference and qualitative interpretive analysis was used to make sense of the data. While teachers were positive about their training and the minimum learning levels, used demonstration and real objects well and showed greater understanding of marginalised students, they found child-centred pedagogies difficult to implement, and the majority integrated their activities into more traditional rote learning. The cultural constructs of 'holism and conceptions of task as duty, appear to be conducive to reform. In contrast, the significance given to hierarchy and collective decision-making appear to be resistant to change.' (p.30). Training was marred by teacher

What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?

educators using rote learning rather than modelling the new methods while visits from trainers and the monthly visits by teachers to the Cluster Resource Centres did not support child-centred practices nor reflection on practice.

The last three mixed outcomes studies are on a smaller qualitative scale and from East Africa, exploring how teachers have understood and engaged in learner-centred pedagogies. The study by Vavrus and Bartlett (2012) of an intervention looked at how learner-centred education is understood and localised in real classrooms by teachers practising under material constraints and in different cultural, political, and socio-economic contexts. They used observations and interviews, drawing on 23 upper secondary school teachers in six non-governmental church schools who had taken part in a workshop discussing learner-centred practices, employing inductive analysis. Teachers were positive about the method and used group work, but persisted in demonstrating a given knowledge set rather than constructing meaning with their students. They were constrained by lack of resources for their classes of over 70 students, the need to cover the curriculum and the fear of losing their authority. Both Vavrus and Bartlett and Clarke challenge the concept of universal 'best' pedagogic practices, context and culture having a profound impact on what and how is taught.

Altinyelken's 2010 study on reform in Uganda explored teachers' views and practices on the new thematic curriculum introduced nationally in 2006, using eight schools in Kampala where the curriculum was piloted, drawing on 35 teachers and four deputy/head teachers, as well as 28 lesson observations in P1 and P2 classes. Students came from a variety of backgrounds, including many from the conflict-afflicted north, and spoke many languages. Altinyelken drew on interview and observations, and as with Vavrus and Bartlett, found that teachers were positive about the curriculum and pedagogy, used groups and TLMs well, had a greater variety of methods, including a structured practice, and drew on student's prior learning. However, only a small number of teachers made major changes, and student interaction in groups was sometimes devoid of learning, mostly because class sizes were too big, resources scarce and there were eight subject areas to be covered. The national in-service training for the thematic curriculum was too short with few follow-up visits, and these rarely seeing advisers observing the teachers in their classrooms. It is the implementation of the curriculum that is criticised rather than its design and pedagogy.

Finally, the study by Arbeiter and Hartley (2002) collected information about the practical implications of integrating children with disabilities in mainstream schools, within the context of the Salamanca Declaration and within existing conditions. Twenty-eight teachers, 3 head teachers and 23 students were interviewed, in three rural primary schools, using observation, interviews and focus group discussions, and data analysed through comparison and convergence. This study came in under contingent criteria because of its focus on disability, the numbers of respondents and the details of pedagogy, allowing the review to fill a perceived gap. Teachers reported confidence in identifying and teaching students with disabilities, with previously negative attitudes towards such students dissipating through sheer exposure; a smaller proportion adapted their practice to support them and more positively, parents were very happy about the integration policy. Even so, the predominant mode of instruction was teacher-centred, lectures and group chanting. Large classes of 150 with few resources hampered differentiation for the disabled students apart from sitting in the front row and teachers using gesture to communicate with hearing-impaired students.

4.6 Positive outcomes identified by studies

Student scores obtained through tests administered by researchers were used in three of the highest rated studies seen above - Arkorful (2012), Coffey International (2012) and NCERT (2011). However, getting data was problematic and none of these used baseline

and post-intervention data as discussed above. Three observational-analytical studies and one quasi-experimental study were able to correlate the use of specific practices with student scores, however. Bhattacharjea et al. (2011 H/H) in India used both baseline and endline data on teaching and learning in rural Indian schools at Std 2 and Std 4 across a calendar year and found a clear relationship between ‘child friendly’ classrooms’ where group work, use of familiar examples and students asking questions were encouraged, but these were seen in fewer than 20% of the 1,706 observed classrooms. In the three other studies, planning, questioning, testing, homework and unspecified ‘interactive approaches’ and positive student achievement were correlated with positive student attainment (Aslam and Kingdon, 2011 H/M; Nannyojo, 2007 M/M; Vithanapathirana, 2006 M/M). Even so, the lack of detail of these pedagogical practices and their contexts makes it difficult to state with more confidence precisely what kind of questioning or testing led to higher achievement.

Other studies used other, less objectively assessed, proxies to assess impact through researcher observation, interviews and teacher or parental report. Two studies reported higher student achievement as a result of bespoke teacher education with follow-up visits, but through teacher report only (Guzman et al., 2000 M/M; Leach, 2004 H/H). Alexander (2008) points out that when students are asked about quality, they rarely mention the cognitive domain or test scores; for them, the affective domain is more important. In seven studies, students were reported as being more motivated to learn, were more engaged in their learning and spent more time on task, were enthusiastic and more confident and happier to be in school as a result of more student-centred learning, often supported by technology (Altinyelken, 2010 H/H; Holland et al., 2012 M/M; Hussain et al., 2007 M/M; Kelani, 2009 M/M; Lall, 2011 M/M; Leach, 2004 H/H; NCERT, 2011 H/H). However, only in Lall’s study were student voices ‘heard’ directly. Increased student attendance as a result of pedagogic practices was more easily measured; however, studies rarely gave specific percentage increases, but reported higher or more regular attendance levels (Guzman et al., 2000 M/M; Holland et al., 2012 M/M; Khamis, 2011 M/H; Leach, 2004 H/H; Power et al., 2012 M/M). Two further studies cited parental, teachers’ and education officials’ pride in the achievements of cluster schools (Guzman et al., 2000 M/M) and principals positively drew on teachers as a source of information (Lefoka and Sebatane, 2003 H/H).

Other less tangible outcomes included teachers curtailing their use of corporal punishment and feeling more respected (e.g. Saigal 2012 H/H), teacher satisfaction with their training (Hussain et al., 2007 M/M), greater teacher confidence in using TLMs, particularly ICT (Leach 2004 H/H; Kelani 2009 M/M) or increase in teacher knowledge of student-centred methods (Price-Rom and Sainazarov 2010 M/M).

Research gaps here are in using rigorous baseline and post-intervention student attainments, linking particular strategies and practices to student learning outcomes as measured by tests used nationally such as curriculum benchmarks or standardised tests administered by researchers for the purposes of the research, so matching what was actually taught. Other considered indicators that can be robustly measured may be useful too, such as attendance, student participation in class (disaggregating participation by girls, marginalised students, disabled students) and use and frequency of use of TLMs.

The rest of this chapter details the evidence presented in the theory of change for pedagogic approaches, strategies and practices.

4.7 Pedagogic theory and pedagogical approaches

As foreshadowed in the earlier thematic overview, social constructivism and constructivism were referred to most frequently in terms of theories of learning. Several studies discussed the differences between constructivism and social constructivism, and

the importance of children constructing and participating in their own learning to develop their thinking (e.g. Altinyelken, 2010 H/H; Coffey International, 2012 H/H). However, few studies (only nine in total from the 45 included) referred directly to any theoretical framework. Unsurprisingly, the pedagogical approaches given were primarily student-/learner-centred (n= 14) or child-centred (n=10). This had several different names in India, such as joyful learning, child-friendly or guided play indicating the recent resurgence and appropriation of child-centred pedagogy. ABL comes nearest to being 'child-centred' according to its theoretical origins, but here the authoritative role of the teacher and visible pedagogy is located in the learning ladders that students are directed to and the child does not have real choice and agency. Other studies used the term 'activity-based learning', referring to a particular package of teaching and learning materials found in India and recently in Ghana (n=3), 'progressive pedagogies' (n=2), 'inquiry based' learning (n=1) or 'communicative' approach (n=1). As pointed out earlier, these terms often assumed reader knowledge of the practices they encompassed such as group work and discussion, but did not always spell out what they entailed.

4.8 Teachers' attitudes and beliefs

This review earlier set out the concept of pedagogy as thinking and as practice, the one informing the other. Several studies reported on teachers' attitudes towards the promoted pedagogy and their students, and these seemed to be linked to their teaching strategies and practices. Numbers of studies with positive outcomes are given in brackets preceded by a '+' sign and the number of those studies that gave evidence of higher student attainment follow the forward slash. The numbers of studies indicating negative outcomes for that aspect are also bracketed, preceded by a '-' sign.

Positive attitudes towards 'student - , learner- or child-centred' pedagogies and training
+(4/2) -(8)

Teachers reported feeling positive towards their training and the practices being promoted in four studies of interventions and one reform across Ghana, Tanzania, Uganda, and India (Clarke, 2003 H/H R; NCERT, 2011 H/H Int; Coffey International, 2012 H/H Int; Conway et al., 2012 H/M Int; Vavrus and Bartlett, 2012 H/H Int). These studies suggest some harmony between culture and pedagogy, because of the coherence between training, pedagogy used and classroom context with the rationale for the pedagogy made obvious as a result. Even so, a positive attitude did not guarantee more student-centred learning in the short or long term as all these studies reported mixed outcomes, but it indicated a constructive starting point by which teachers developed their understanding of student-centred pedagogies. In Clarke's 2003 study, an intensive 10-day INSET programme run under the district Primary Education Programme targeted at girls and children from Scheduled Castes led to practice that partially reflected the training: 'Teachers' thinking which reflected the importance of demonstration, and activity and instructional aids are evidently translated into practice in the classroom' (p.35), but cultural clashes 'prevent [ed] a fundamental alteration of tradition practice' (Clarke 2003, p.37), findings echoed by Conway et al. and Vavrus and Bartlett. Time was expressed as key to winning ABL teachers over to the new pedagogy: 'It is not only important to see to it that teachers acquire sufficient experience in organising ABL classrooms, sufficient time may be needed for teachers of later phase schools to implement ABL' (NCERT, 2011a, p.38).

Cultural constructions of the teacher as authoritative created some resistance to more student-centred approaches seen in eight further studies from East Africa, India and Burma (Altinyelken, 2010a H/H R; Barrett, 2007 H/M EC; Hardman et al., 2009 H/H Int; Kunje et al., 2003 M/H Int; Lall, 2011 M/M Int; Pontefract and Hardman, 2005 H/H EC; Smith et al., 2005 H/H EC; Vavrus, 2009 M/H EC). These studies reported mixed or ineffective pedagogies, practised under challenging conditions of large classes and few

resources even in the two studies on interventions. Challenging such cultural beliefs is an important part of teacher education, but even where trainees and NQTs are positive about their training, as Pryor et al. (2012 M/H EC) found, their confidence may be misplaced if their training does not challenge entrenched beliefs about the role of the teacher.

Positive attitudes towards marginalised students +(6/1)

Teachers' positive attitudes towards their students were particularly important given that the majority of studies characterised the student population as being those who were often most marginalised by society and likely to be different from the majority of teachers' own backgrounds and experiences. Teachers who had positive attitudes towards girls, overage students, those marginalised by class and caste, and students with disabilities were more likely to be socially responsive towards them in their practice. This attribute emerged from six studies across India, Ghana, Kenya and Uganda (Altinyelken, 2010a H/H R; Clarke, 2003 H/H R; Coffey International, 2012 H/H Int; Hardman et al., 2009 H/H Int; Sarangapani et al., 2013 M/H EC; Sharma, 2013 H/H EC). For Sarangapani et al. and Sharma in India, teachers identified as innovative had a critical awareness of students' backgrounds and commitment to alter their conditions through progressive pedagogies. The mixed outcomes study from Uganda by Arbeiter and Hartley (2002) found that teachers' and the whole schools' more positive attitudes towards working with disabled students was the precondition for their inclusion, more important in practice than infrastructure, resource or specialised teaching strategies. Apart from the Coffey paper, teachers here worked generally under challenging conditions that had perhaps stimulated their approach but also constrained their practice. Seeing learning as successful only if all students are included and learning will need further evidence of how widespread such attitudes were amongst the teacher population and the impact it has on their students.

4.9 Pedagogic strategies

Feedback, sustained attention and inclusion +(7/4) -(6)

Seven studies report teachers paying positive attention to students while six studies provide evidence of where teachers paid less attention. Teachers' positive attitudes towards their students, cited in three studies above, impacted on what was near to critical pedagogic practice, as teachers were seen to tailor instruction around individual levels of knowledge and achievement, or focused on quieter students, girls and those from low SES backgrounds or Scheduled Castes; this is seen in Clarke (2003 H/H R) Sarangapani et al. (2013 M/H EC) and Sharma (2013 H/H EC) and also in NCERT (2011 H/H Int), Khamis (2011 M/H) and Saigal (2012 H/H Int). Setting frequent homework, quizzes and tests with constructive feedback correlated with raising student attainment, as seen in two observational-analytical studies by Nannyonjo (2007 M/M Obs-A) and Aslam and Kingdon (2011 H/M EC) and supported by qualitative findings from Coffey International 2012 (H/H Int).

More negative teacher attitudes impacted on disabled students in three further studies. While teachers were observed monitoring individuals in large classrooms, students with special needs did not get much attention according to two further studies by Arbeiter and Hartley (2002 H/H R) and Nakabugo et al. (2006 M/H EC). Singal (2008 M/H EC) found that teachers from India who did not believe that disabled students should be integrated into mainstream schools created a learning environment in which 'the [disabled] child was a part of the classroom, but stood apart in many ways' (p.1525). In three studies, teachers did not know what to do with students who had not learnt the lesson content apart from repetition or were unable to identify struggling students. Here communication was one-way only in direction, from teacher to student. Large class sizes prevented these teachers

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from organising differentiated tasks or from using group work where students could support one another, and the ability gap widened here in every lesson (Alexander, 2001 H/H EC; Bhattacharjea et al., 2011 H/H EC; Pontefract and Hardman, 2005 H/H EC). Research into how teachers pay attention to students in large classes and record their assessments, perhaps in a case study form, would fill a research gap.

Drawing on students' sociocultural backgrounds +(5/1) -(2)

In a domino effect, teachers who were positive towards their students, paid them attention; they also extended this to draw on students' backgrounds and prior knowledge and used local examples, so making lesson content relevant and meaningful. This was particularly important with students who had a smaller social and cultural capital to draw on and for whom the curriculum and school itself might feel very distant from their own experiences and those of their families. This was seen in five studies (Arkorful, 2012 H/H Int; Barrett, 2007 H/M EC; Khamis, 2011 M/H Int; Sarangapani et al., 2013 M/H EC; Sharma, 2013 H/H EC). Only in Arkorful's study were conditions optimal and the curriculum and training geared towards teachers working with marginalised students; in the other studies, teachers taught large classes with few resources, but were still able to reach out towards their students. Conversely two studies from Ghana and Uganda pointed out that teachers rarely connected lesson content to students' experiences (Akyeampong, 2003 M/H EC; Holland et al., 2012 M/M R). Drawing on students' backgrounds is central to student-centred learning, based as it is on social constructivism, but the handful of studies that report this practice may indicate teachers' incomplete grasp of the pedagogy and of social constructivism as a theory of learning, or unfamiliarity of the students' backgrounds, or highlight an omission in research where this was not seen as a focus for observation.

Creating a safe environment in which students are supported in their learning +(6/2)

Research on neuroscience carried out for the initial scoping for this review found that children remember more of the learning when they are not stressed, with an emotional aspect to be gained through social interaction in the classroom (Goswami 2004). These findings are reflected in six studies which described 'lively, warm and friendly teachers' who engaged even very large classes across India, Ghana, Tanzania, and Uganda (Arkorful, 2012 H/H Int; Coffey International, 2012 H/H Int; Nakabugo et al., 2006 M/H EC; Vavrus, 2009 M/H EC; Saigal, 2012 H/H Int; Sarangapani et al., 2013 M/H EC). This strategy included not using fear and withholding corporal punishment. This is a more subjective quality to report on, difficult to quantify or even describe, being made up of teacher characteristics and personalities. It is also difficult to link to student learning outcomes, but encourages students to participate without fear and so lends itself towards more student-centred and democratic classrooms and indicates a move away from a behaviourist carrot and stick approach. These six studies cited students' greater confidence and happiness in being at school as indicators, disposing them more favourably towards learning.

4.10 Individual teaching practices in detail

The three strategies introduced above, characterised as communicative and encouraging to students, also characterise the ways in which teachers implemented teaching practices so that their students were engaged, happy - and learnt.

Use of group and pair work +(15/4) -(5)

While group and pair work are seen as key practices within student-centred learning, evidence for their effective use is mixed, with precise learning outcomes of using such

practices often unclear. Overall, 15 studies found group or pair work being implemented and practised and reported as being effective, mostly in interventions, but also in existing conditions in large resource-constrained classrooms. There is also good evidence of ineffective use of group work, all under existing conditions. Indicators used for its effectiveness were that students were happier, confident and participated in the learning. The study by Nannyonjo (2007 M/M) found that 'Pupils who worked together in pairs or in small groups (with or without assistance from a teacher) had higher scores than those who did not', supported by teachers' monitoring of the groups (p.52). Similarly Bhattacharjee et al. (2011 H/H) found that working in small groups was strongly correlated with Standard 4 learning outcomes but less so with Standard 2 outcomes. Further observational details are missing for both of these studies, however.

Group work is the de facto way of seating students as reported in the NCERT (2011 H/H) evaluation of Activity-Based Learning in Tamil Nadu where students interact freely with one another to facilitate learning but work at their own pace through self-study materials and learning ladders while the teacher supports groups and individuals. Students were reported to be more confident and motivated and their achievements increased, although evaluators were cautious in attributing this solely to the ABL pedagogy. Conditions are designed to fully support this approach, with tailor-made learning materials related to students' lives, low-level tables, chairs and blackboards, and use of outdoor or out-of-school learning activities.

Students in Somalia in integrated Quranic schools often worked in small groups in a study by Khamis (2011 M/H Int). Teachers trained under an intervention funded by UNICEF focused attention on these small groups to guide them using co-operative learning; 'What appears ostensibly to be a multigrade or mixed ability setting is actually a much more dynamic and rational grouping of learners based on experience, ability, need and aspiration' (Khamis, 2011, p.44). Outcomes here were the increased good relations between teachers and the marginalised students, including girls, and increased enrolment and access for them, suggesting that group work contributed to this more encouraging environment.

In Sharma's study (2013 H/H) effective teachers placed students in mixed ability groups or pairs to support one another in discussions, seen as these teachers' key practice, and to share scarce resources. Teachers worked flexibly and circulated to ensure that each child was able to hold and see, for example, pictures from magazines, and rotated those who sat in the front to the back and paired weaker with stronger learners. A different use of ability groups was seen in Saigal's study (2012 H/H), where a teacher put students in ability groups with differentiated work following a diagnosis of each student's level. However, outcome measures here are dependent on how far the teachers used the student-centred pedagogies promoted by the Quality Education Programme rather than student learning outcomes.

Teachers' use of pair or group work balanced with whole class or individual work appeared to support students' attainment in two further studies by Arkorful (2012 H/H) in Ghana and Hardman et al. (2009 H/H) in Kenya. In Arkorful's study, students and their teacher spent time rearranging the rows of desks from the formal school held in the mornings into groups, so making the learning environment their own and fitting the interactive and lively approach of SfL. Teachers also used more pair work than in any other study for students to discuss a problem together. Students were, however, only assessed through national tests once integrated into the formal schooling, so again, the precise effectiveness of group work is difficult to gauge. In the study by Hardman et al., the key resource teachers who had received the benefit of direct training used group work more successfully and less ritualistically than their untrained peers, even with larger groups of students. According to the teachers and the school management committee, students' results improved, but no details of this are given. Group work in these studies was greatly facilitated by the use of

a local or familiar language, even though in the study by Hardman et al. (2009), this went against official policy. The importance of fluency in a language was corroborated in four further studies, one by Power et al. (2012 M/M) in Bangladesh, where students' greater proficiency in English was partly attributed to more interactive and communicative practices, including group work, although few further details were given of group work. Barrett (2007 H/M) in Tanzania found that more varied methods, including group work, were used in Swahili and mathematics, where language was not such a barrier. Geeves et al., 2006 (M/H) in Cambodia found that group and pair work was hampered by the limited linguistic ability of students and little space for group work, as did Lall (2011 M/M) in Burma, who found that classes with over 100 students with immovable desks proved a considerable barrier and with parents worried about noise levels, even while reporting outcomes that students were more engaged as a result of group work attempted.

The adoption of some group work was also a common way of adapting to difficult conditions of large class sizes and sharing scarce resources, but it also ran the risk of increasing teacher preparation time and noise levels, as seen in four studies from East Africa. In a study of secondary classes by Vavrus and Bartlett (2012 H/H) in Tanzania following a workshop on learner-centred pedagogy and content knowledge, group work was used to discuss and present answers, but teachers did not encourage higher-order thinking that allowed students to arrive at different conclusions. Outcomes here centred on practices rather than on student attainment. Further evidence from Uganda support these mixed results. All teachers in Altinyelken's study (2010 M/H) revised their seating in response to student-centred pedagogy promoted in the thematic curriculum and placed students in groups particularly, at news and story time. Some ensured that their learning was meaningful, with measures of effectiveness seen as teachers reporting greater student engagement. The majority of teachers, however, were unable to overcome classroom conditions and group work did not engage the many rural and overage students present in their classes. In the study by Nakabugo et al. (2006 M/H), the group work observed in 31% of lessons allowed teachers movement around the class to monitor individuals, but the most able students dominated and as a result, students often worked as individuals.

There is, conversely, good evidence of classes where no group work took place, all under existing conditions and predominantly in sub-Saharan Africa and in India and where students were not learning. The evidence is from three studies: Akyeampong (2003 H/H); Lefoka and Sebatane (2003 H/H) and Smith et al. (2005 H/H). In these studies, students sat in permanent rows with little student-to-student interaction and teachers predominantly taught from the front, used closed question and answer and demonstration. Two studies, by Hardman et al. (2009 H/H) and Bhattacharjea et al. (2011 H/H), pointed to an 'active' zone of participating students seated at the front of the class near the teacher, who had higher test scores than those more inactive students seated elsewhere and at the back of overcrowded classrooms. Conditions were poor, with large classes and few resources, poor alignment of ITE with classroom pedagogies and use of L2 as the language of instruction.

Few if any studies gave details of the kinds of tasks given to groups, how this fitted into the rest of the class and learning, the discourse used by students, the way in which teachers monitored and intervened in the groups and the kind and level of learning achieved by students as a result. As such, while several studies were assessed highly, and details of different ways of using group work are given, precise benefits and learning outcomes are more difficult to gauge.

Use of teaching and learning materials +(9/5) -(7)

Nine studies reported effective use of TLMs that contributed to student learning, mostly demonstrated in interventions. Five studies of existing conditions mention the sole use of textbook in a prescriptive way or a dearth of textbooks.

Teachers regularly used a variety of TLMs, such as handheld cameras, MP3 players, ABL learning cards, charts, puppet shows and student self-learning notebooks in five studies of interventions that provided bespoke training and some tailor-made resources (Arkorful, 2012 H/H Int; Coffey International, 2012 H/H Int; Leach, 2004 H/H Int; Kelani, 2009 M/M Int; NCERT, 2011 H/H Int;). Indicators of success were on reported, rather than evidenced, increases in student attainment, although Bhattacharjea et al. (2011 H/H EC) found that in the 20% of classes where child-friendly teaching was taking place, higher attainments were seen where the teacher was observed using any teaching and learning materials other than the textbook. In the scaling up of ABL even within the same state, the evaluation reported dilution of the original materials template, leading to less effective use by teachers (NCERT, 2011). However, in the more recent ABL programme in Ghana, the primary teaching and learning materials remained the blackboard, student notebooks and some textbooks (Coffey International, 2012). Teachers used more materials relevant to students effectively, for example linking pictures to prior knowledge (Hardman et al., 2009 H/H Int; Sharma, 2013 H/H) but there was little further evidence of what kinds of materials were used, or how.

While interventions afforded teachers a range of materials, other studies of existing conditions reported the textbook used as the sole reference point with teachers not deviating from its prescription, or a dearth of textbooks leaving teachers with just a blackboard or possibly, for student teachers, handouts (Alexander, 2001 H/H EC; Ampiah and Mankoe, 2006 H/H EC; Bhattacharjea et al., 2011 H/H EC; Lefoka and Sebatane, 2003 H/H EC; Nsibande and Modiba, 2012 M/M EC; Sarangapani et al., 2013 M/H EC; Sharma, 2013 H/H EC). Textbooks, when available, were pitched above students' understanding, sometimes by two years, and when there were curriculum guidelines and materials, teachers used the activities uncritically (Bhattacharjea et al., 2011 H/H EC; Nsibande and Modiba, 2012 M/M EC).

While some studies did give details of how teachers simply read from the textbook without considering their class or learning objective, further details of how teachers use a textbook and other materials well, including effective board work, or whether they produce their own materials, how they store them and make use of them, is a wide gap.

Questioning +(10/4) -(7)

Effective use of questioning and response was reported in 10 studies in a range of settings, including within a whole-class format in existing conditions. There was, however, better evidence in seven studies reporting less skilful questioning, partly because several studies, particularly those authored by Hardman, quantified their observation data into question type and frequency. Even so, as before, students' improved results cannot be fully attributed to specific use of questioning because of the difficulties in testing out correlations amidst naturalistic research. Nannyojo (2007 M/M Ob-A) and Aslam and Kingdon (2011 H/M) both found that involving students via questioning correlated to higher student scores, but they did not isolate out questioning from other practices.

The most effective practice from further qualitative studies appeared to be where teachers asked a variety of questions drawing on students' backgrounds and ranging from closed, recall questions to higher order, open questions with feedback embedded through elaboration, rephrasing and probing, seen in three studies (Arkorful 2012, H/H Int; Coffey International, 2012 H/H Int; Sharma, 2013 H/H EC). The best teachers in Sharma's study gave children time to speak, did not interrupt and listened to them. Trained teachers also listened to students' responses and followed these up via explanation as well as encouraging student questions in the study by Hardman et al. (2012 H/H EC). Training had some impact on how these teachers posed questions, and they used them in a range of classroom settings, such as group work, to encourage high cognitive development and to stimulate open-ended discussion. Similar effective questioning was seen within a whole-

What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?

class, more traditional question and answer format in four further studies on existing conditions (Barrett, 2007 H/M EC; Nakabugo et al., 2006 M/H EC; Sarangapani et al., 2013 M/H EC; Vavrus, 2009 M/H EC). These studies indicate what may be possible even under more challenging conditions, but many still do not give precise details of teacher discourse to fully assess whether or not and how their questioning is effective.

Conversely, seven studies in existing conditions pointed to teachers' poor use of question and answer, with high percentages (e.g. 97% in Hardman et al., 2012, included for both positive and negative outcomes here) of closed questions requiring recall, eliciting or checking factual information within an overall more behaviourist pedagogy (Ackers and Hardman, 2001 M/M EC; Alexander, 2001 H/H EC; Alhassan and Adzahlie-Mensah, 2010 M/M EC; Ampiah and Mankoe, 2006 H/H EC; Hardman et al., 2012 H/H EC; Lefoka and Sebatane, 2003 H/H EC; Smith et al., 2005 H/H EC). Questioning was also the dominant strategy in these classrooms, but here teachers asked all the questions, often in quick succession with little time to listen or respond to students' answers, and higher order questions were rare. Student responses were often choral, seen as cued elicitations, requiring single-word answers. In these less effective practices around questioning from Tanzania, Kenya and India, teachers rarely rephrased, elaborated or probed a student's response apart from short praise or whole-class clapping; Hardman et al. point out that while students were involved, their understanding was not checked - and hence in these ritualistic question and answer sessions, 'no learning' took place (Hardman et al., 2012, p.828). Large classes, scarce resources, outdated ITE and little CPD contributed to the poor practices observed.

Demonstration, explanation drawing on sound pedagogical content knowledge +(8/1) -(13)

Eight studies, mostly in large resource-constrained classrooms, identified effective use of demonstration and explanation, while thirteen studies identified more didactic practice with little interaction that was very similar in its description across different contexts but was resource poor. In resource-constrained classrooms, teachers' skill in giving good explanations is critical to student learning as they cannot rely on ample materials, small classes and children with books at home. Instead, teachers have to rely on the psychological and cultural tools of language and some board writing to get a concept across, perhaps with a few bottle tops and pictures on a manila chart.

Teachers' imaginative explanations and demonstrations of the content to be taught, delivered with confident pedagogical content knowledge, were seen in eight studies. They offer details of practice such as a teacher (Sharma, 2013) pulling together students' responses into a visual diagram on the board or facilitators (Arkorful, 2012) using songs, actions and games and using TLMs, especially real objects, to show and illustrate the central concept. Students were often asked to come to the board to explain the concept again to peers or complete tasks on the board (Arkorful, 2012 H/H Int; Clarke, 2003 H/H R; Guzman et al., 2000 M/M Int; Hardman et al., 2009 H/H Int; Kelani, 2009 M/M Int; Nakabugo et al., 2006 M/H EC; Sharma 2013 H/H EC; Vavrus and Bartlett 2012 H/H Int). The interventions here reported improvement in student learning outcomes or students reported improved quality of lessons.

However, use of songs and games as 'time out' activities rather than as being integral to the learning were reported in four further studies, indicating the skill needed to give effective explanations, even with interventions that provide more optimal conditions and training (Altinyelken, 2010 H/H R; Arbeiter and Hartley, 2002 H/H R; Dyer, 2008 M/M EC; NCERT, 2011 H/H Int). Demonstration as lectures became the default way of teaching in nine studies of existing conditions where classes were invariably large, resources scarce and training misaligned to these contexts. Teachers here lectured didactically without any interaction, often for 98% of the time, telling the students the content, reading verbatim from the textbook or putting what was to be learnt on the board for students to copy or to

recite. Here there was little evidence of a developed pedagogical content knowledge or evidence that teachers were anticipating students' difficulties or pitching the lesson to the students' levels (Alexander, 2001 H/H EC; Ampiah and Mankoe, 2006 H/H EC; Bhattacharjea et al., 2011 H/H EC; Hardman et al., 2009 H/H Int; Hardman et al. 2012 H/H EC; Lefoka and Sebatane, 2003 H/H EC; Nsibande and Modiba, 2012 M/M EC; Pontefract and Hardman, 2005 H/H EC; Smith et al., 2005 H/H EC). What is striking is the great similarity in the way in which these studies, across different contexts, describe this didactic teaching mode where, as with questioning, little learning took place. The prevalence of this practice may well account for the low levels of student outcomes seen in national tests.

Teachers' effectiveness is built on their disciplinary knowledge, evident in their PCK as seen in their demonstrations and explanations, use of higher order questioning and design of tasks that cognitively challenge students. However, five studies across Uganda, India, Malawi and Lao PDR found that some teachers' levels of content and pedagogical content knowledge remained low or not at the levels needed to support different and more flexible pedagogic approaches to teaching such as problem solving, applying knowledge, particularly in mathematics, even after professional development (Bhattacharjea et al., 2011 H/H EC; Conway et al., 2012 H/M Int; Guzman et al., 2000 M/M Int; Kunje et al., 2003 M/H Int; Pryor et al., 2012 M/H EC). Few studies directly assessed teachers' levels of content knowledge, the practices used and the students' levels of knowledge, although Bhattacharjea comes nearest in pointing out that in mathematics students' mean score increases as the teachers' increases. Even so, teachers' qualifications or certification appear not to make any difference and are not related to student achievement as seen in three observational/analytical studies by Nannyonjo (2007 M/M), Aslam and Kingdon (2011 H/M) and Bhattacharjea et al., 2011). The low entry level at which the majority of trainees enter ITE in sub-Saharan Africa as seen in Pryor et al., 2012's study and yet gain certification supports this.

Further research on how teachers increase their content knowledge, its relation to practices and student outcomes is needed to strengthen the evidence base here. As a central pedagogic practice, studies could more easily isolate demonstrate and assess students' understanding of the concept being taught through their written or verbal responses as no study explicitly made this connection.

Use of local languages +(9/3) -(3)

Interactive classrooms were those where a familiar language was being used, seen in nine studies, whereas didactic ritualistic practices were observed in classroom, where an unfamiliar language was used, reported in three studies.

The use of a local language familiar to students was seen to greatly facilitate student learning in nine studies, giving immediate access to teachers' explanations and allowing for the higher cognitive thinking needed for abstract concepts. It also made group work meaningful and so facilitated more varied methods promoted in national reforms and interventions focused on student-centred pedagogies (Arkorful, 2012 H/H Int; Atinyelken, 2010 H/H R; EC; Barrett, 2007 H/M EC; Coffey International, 2012 H/H Int; Holland et al., 2012 M/M R; Leach, 2004 H/H; Khamis, 2011 M/H Int; Sarangapani et al., 2013 M/H EC). In Somalia, Khamis (2011 M/H) reported that Somali was used to instruct and for discussion even in Quranic classes reading in Arabic. Five of these studies reported higher student attainment, particularly those interventions or pedagogies where use of the local language was central and in comparison to more private schools or formal education schooling that used English as the language of instruction (e.g. Arkorful, 2012 H/H; Coffey International, 2012 H/H; Sarangapani et al. 2013 M/H).

What is the evidence on the effectiveness of pedagogical practices, in what conditions, and with what population of learners?

Practice was more ritualistic in classrooms where English or other L2 language was used and contributed to the more didactic style and poorer outcomes described in the previous section such as in Ampiah and Mankoe (2006 H/H EC), Hardman et al. (2008 H/H EC), Smith et al. (2005 H/H EC). Hardman et al. (2009 H/H) reporting mixed results from Kenya, point out that teachers' use of local language went against official policy and made its use more circumspect than necessary.

Planning and structure of lessons +(11/3) -(15)

Eleven studies found some variation in lesson structure, albeit only three provided evidence of higher student attainment. Fifteen studies reported on standard practice, with predictable sequencing of lesson activities contributing to little learning.

Variation in lesson structure challenges students' expectations and makes them alert and engaged, and in the best practice, fits students' specific needs, as student-centred pedagogy is meant to do. Teachers also need to understand how one part of a lesson builds upon the next, as well as having a longer term perspective on the objectives of a series of lessons over a week, month or term and how each one builds upon the last. Action research by Vithanapathirana (2006 M/M Int Obs-E) in Sri Lanka enabled teachers to sequence lessons for multigrade classrooms, with post-test scores for students increasing in grades 4 and 5, while lesson planning was one of the key 'process' variables found to make an impact on students' achievement by Aslam and Kingdon (2011 H/M EC Obs). Three interventions provided scripted lesson plans with structured sequences that supported teachers, and all reported higher student attainment (Arkorful, 2012 H/H; Coffey International 2012 H/H; NCERT, 2011 H/H). Teachers who planned lessons taught a better sequence of tasks that involved recapping prior learning, only talking for 50% of the time, and varied type and time of lesson components such as whole-class, lecture, demonstration, discussion, group and individual work. As a result, there was more participation from students, even when the actual teaching remained what could be labelled teacher-centred and involved rote learning and drilling, but in ways that engaged students as in studies by Arkorful (2012 H/H Int), Clarke (2003 H/H R), Conway et al., (2012 H/M Int), Khamis (2011 M/H Int), Kunje et al. (2003 M/H Int), Sharma (2013 H/H EC).

Much of the poorer practice described in these sections is partly due to the oft-quoted 'standard practice', the predictable shape of lessons informed by behaviourism, often taught in ITE (Dembélé 2005; Pryor et al., 2012.) The majority of teachers made only minor changes to traditional frontal teaching even in interventions with little variation or prior planning (Altinyelken, 2010 H/H R; Arbeiter and Hartley, 2002 H/H R; Conway et al., 2012 H/M Int; Hardman et al., 2009 H/H Int; Holland et al., 2012 M/M R; Nakabugo et al., 2006 M/H EC). As with questioning and demonstration, studies on existing conditions and some reforms with large classes, scarce resources and outdated and misaligned ITE found the same lesson structure taught repeatedly with little student learning (Alexander, 2001 H/H EC; Akyeampong, 2003 H/H EC; Ampiah and Mankoe, 2006 H/H EC; Bhattacharjea et al., 2011 H/H EC; Dyer, 2008 M/M EC; Lefoka and Sebatane, 2003 H/H EC; Ngware et al., 2012 H/M EC; Pryor et al., 2012 M/H EC; Smith et al., 2005 H/H EC).

Further research looking at how ITE and textbooks represent how a lesson is structured and present a series of lessons, and what opportunities and encouragement exist for teachers to vary this according to their context and students, might indicate why teachers continue to teach in such a structured way.

5. How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

Studies reporting pedagogic practices with positive outcomes also reported on the factors that enabled or supported such practices, and indicated where factors disabled the implementation of effective practices or prevented them altogether. As with the strategies and practices, the review synthesised these factors, and four facilitating factors emerged: professional development aligned with classroom practices and with follow-up support; peer support; support from the head teacher; and a school curriculum where assessment aligned with its content. Conversely, there were five factors that prevented teachers from implementing effective practice, often the inverse of those favourable factors: misalignment of initial teacher training with school curriculum; misalignment of continuing professional development with the promoted pedagogy; limited resources and large class sizes; curriculum and assessment; and poor communication with the community and policy makers.

The numbers of studies with positive outcomes are given in brackets preceded by a '+' sign and the number of those studies that gave evidence of higher student attainment follow the forward slash. The numbers of studies indicating negative outcomes for that aspect are also bracketed, preceded by a '-' sign.

5.1 Professional development: alignment with classroom practices and follow-up support

Teacher training

Five interventions designed training to fit specific pedagogies to specific contexts, such as activity learning or Schools for Life for rural communities and marginalised students, or use of technology to support the curriculum, or, as in the study by Hussain et al., addressing the subject and pedagogical content knowledge and reflective skills required for teachers being trained as mentors (Arkorful, 2012 H/H Int; Hussain et al., 2007 M/M Int; Kelani, 2009 M/M Int; Leach, 2004 H/H Int; Saigal, 2012 H/H Int). These reported that teachers implemented the training received and lessons were more interactive and enjoyed by students. Hussain et al. (2007) reported that the training was also cost-effective, although no evidence was given to support this. +(5/2)

Teacher manuals with scripted lessons were cited as supporting the translation of newly acquired theoretical knowledge into concrete practice in three studies, by Arkorful (2012 H/H Int), Coffey International (2012 H/H Int) and NCERT (2011 H/H Int), and we have seen earlier how such teacher guides support teachers in teaching a more varied lesson sequence. This may also reduce the need to recall large amounts of unnecessary information, which these unqualified teachers may find challenging (Abadzi 2006). +(3/3)

The expertise of the teacher educator in teaching or modelling the promoted strategy made a considerable difference to the quality and outcome of professional development in two studies as reported by the mentors and students who were the beneficiaries, as reported in Hussain et al. (2007 M/M Int) and Kelani (2009 M/M Int). If teachers have not seen or experienced a different way of teaching, they cannot be expected to implement it themselves, alone, in their classroom. The limited teaching experience and cultural differences of teacher educators were a stumbling block, however, for example where teacher educators selected only the pedagogy they understood and taught using rote learning, as observed by Clarke (2003 H/H R) or where teacher educators' limited capacity to teach multigrade teaching prevented a greater spread of student improvement, as

described by Vithanapathirana (2006 M/M Int). In the study by Kunje et al. (2003 M/H Int) teacher educators' morale was low because they felt their skills were undermined by the school-based structure of the Malawi Integrated In-service Teacher Education Programme (MITEP) programme. +(2/1) - (3)

This model of teacher education sharply contrasted with more traditional ITE where there was misalignment between the curricular intentions of ITE and the realities of the contexts in which teachers have to practise, including misalignment with the school curriculum itself. Such ITE curricula were overloaded, outdated, still influenced by a behaviourist approach focused on content knowledge or methods rather than pedagogical content knowledge and mostly directed towards upper primary schools. This was seen in six studies (Clarke, 2003 H/H R; Hardman et al., 2012 H/H EC; Holland et al., 2012 M/M R; Lefoka and Sebatane, 2003 H/H EC; Ngware et al., 2012 H/M EC; Pryor et al., 2013 M/H EC; Vavrus, 2009 M/H EC). These studies were mostly of reforms or existing conditions in East Africa, where often there were too many trainees crowded into small classrooms with few resources. Under these conditions, teacher educators, themselves strangers to more interactive practices, used expository methods with basic group work and advocated a prescriptive teaching sequence with little emphasis on critical and independent thinking for trainees (Dyer, 2008 M/M EC; Kunje, 2002 M/H Int; Lefoka and Sebatane, 2003 H/H EC; Pryor et al., 2012 M/H EC). Akyeampong et al. (2013 M/H EC) observed that where there were simulated classroom activities, these did not 'prepare trainees for the kind of responses and challenges real children are likely to face' (p. 276). These trainees, as NQTs, used their college notes and similarly taught in transmission-oriented ways, neither seeing nor experiencing any other way of teaching. -(6)

Applying new practices in the classroom: Follow-up classroom support +(6/2) -(3)

As in the thematic overview, observation of practice and discussion was the central tool in altering teacher practice following training. Six studies across Ghana, Pakistan, Benin and India reported monthly or six-weekly follow-up sessions at the classroom level, where teachers were observed and given constructive feedback, and also through regular teacher meetings facilitated by the trainer or mentor to discuss practice (Arkorful, 2012 H/H Int; Clarke, 2003 H/H R; Coffey International, 2012 H/H Int; Hussain et al., 2007 M/M Int; Kelani, 2009 M/M Int; Saigal, 2012 H/H Int). In these interventions, teachers' practices reflected their training and they used a range of practices, resulting in higher student attainment in the two Schools for Life studies.

Again, in direct contrast, the practicum taken by trainees on more conventional ITE courses was too short to be useful, unsupervised by tutors and not helped by the physical distance between the site of the training college and the schools themselves. There were often too many trainees at one school to get any proper teaching experience and little or no focus on reading or opportunities to teach the very youngest children as seen in Pryor et al. (2012 M/H EC), Kunje (2002 M/H Int) and Lefoka and Sebatane (2003 H/H EC). According to Lefoka and Sebatane, ITE is sending out NQTs 'who are likely to both use teacher-centred methods in their style of teaching and be insensitive to the needs of a primary school child' (2003 H/H p.xii).

Research that gives further details of training and follow-up classroom support, including the management and administrative structures that helped to make it possible for this take place, particularly in difficult conditions, would be valuable.

5.2 Peer support +(8/2)

Informal peer support provided a continuation of the more formal follow-up support, with teachers learning through situated cognition and social engagement and learning in authentic contexts. Peer support through informal groups, formal clusters or pairs of

teachers at the same school gave teachers opportunities for joint observation, sharing teaching and learning resources, lesson plans and assessment practices. These were described in eight studies as being significant factors in teachers' implementation of effective practices across Ghana, Bangladesh, India, Benin, Cambodia, Egypt and Lao PDR (Coffey International, 2012 H/H Int; Geeves et al., 2006 M/H Int; Guzman et al., 2000 M/M Int; Hussain et al., 2007 M/M Int; Kelani, 2009 M/M Int; Leach, 2004 H/H Int; Power et al., 2012 M/M Int; Saigal, 2012 H/H Int). In four of these, increased student attainment was also reported, while in Geeves et al. and Guzman et al., greater enrolment and attendance was reported. In two, teachers shared and solved technical problems together (Leach, 2004; Kelani 2009). Peer support may also be, as Geeves et al. (2006) suggest, a cost-effective way of developing professionals.

Peer support often emerged from interventions where there was specific training that introduced new pedagogic practices. Further research is needed to take a longer-term view of how peer support works, perhaps over a year, and an analysis of the factors that encourage successful peer support as evidenced in teachers' practices, beliefs, motivation and student achievement. The costs of such peer support in comparison to other forms of professional development would provide evidence for funders in understanding funding priorities.

5.3 Support from the head teacher and the community +(4/1) -(10)

Good support of the school, head teacher and community for teachers and new methods of teaching was cited as a facilitating factor in four studies (Arkorful, 2012 H/H Int; Geeves et al., 2006 M/H Int; Lall, 2011 M/M Int; Power et al., 2012 M/M Int); the lack of support and lack of training in different pedagogies and content knowledge were cited as barriers in five studies (Akyeampong et al., 2013 M/H EC; Alhassan and Adzahlie-Mensah, 2010 M/M EC; Ampiah and Mankoe, 2006 H/H EC; Hardman et al., 2009 H/H Int; Price-Rom and Sainazarov, 2010 M/M Int. Lack of awareness or participation in the intervention or curriculum reform by parents, school management committees or community members hindered, for example, positive parental attitudes towards continuous assessment and language of instruction and so made it harder for teachers to implement these in their practice, as reported by teacher interviews in seven studies (Altinyelken, 2010 H/H R; Hardman et al., 2009 H/H Int; Holland et al., 2012 M/M R; Khamis, 2011 M/H Int; NCERT, 2011 H/H Int; Sharma, 2013 H/H EC).

5.4 Curriculum and assessment

Few studies explicitly pointed to a specific curriculum model, with only the integrated, competency-based thematic curriculum in Uganda named by Altinyelken (2010 H/H R) and Holland et al. 2012 (M/M R), the new competency-based curriculum in India described by Vithanapathirana (2006 M/M Int) and moves towards a competency-based rather than a content-based curriculum in Tanzania (Vavrus, 2009, Vavrus and Bartlett, 2012). Despite curriculum reform, however, the school curriculum remains problematic. It was seen as irrelevant to specific populations of students, particularly rural or marginalised children, too difficult and overloaded, taking up teacher preparation time and increasing lesson pace as teachers felt impelled to cover it to avoid sanctions. This resulted in long hours for students, particularly for young children, with the daily or annual school timetable ill-suited to students who needed to earn money for much of the day (Alexander, 2001 H/H EC; Bhattacharjea et al., 2011 H/H EC; Guzman et al., 2000 M/M Int). -(3)

Where there was alignment between the curriculum and continuous assessment, this was seen to contribute to improved student learning outcomes in Schools for Life in Ghana allowing a tight focus on literacy and numeracy (Arkorful, 2012 H/H; Coffey International, 2012 HH), while teachers in Kyrgyzstan altered their practices towards higher-order,

problem-based thinking to ensure that their students could succeed at new national tests that assessed critical thinking (Price-Rom and Sainazarov, 2010 M/M). +(3/2)

The imperative of high-stakes examinations often compelled teachers to cover the curriculum and so use more teacher-directed methods to do so. This occurred even while the curriculum they were teaching was designed around competencies that promoted learner-centred pedagogies as seen in four studies (Alexander, 2001 H/H EC; Coffey International, 2012 H/H Int; Conway et al., 2012 H/M Int; Vavrus and Bartlett 2012 H/H Int). -(4)

Some CPD courses neglected new curriculum demands, such as continuous assessment, multigrade teaching or working with disabled students, and here teachers were less likely to use the promoted pedagogy or teach the newer content, as seen in Altinyelken (2010 H/H R), Arbeiter and Hartley (2002 H/H R), Guzman et al. (2000 M/M Int). -(3)

A research gap identified here is for studies to track how teachers implement the given curriculum and work towards the assessment mode, using a mixed methods approach to understand teacher processes and student learning over time.

5.5 Barriers to learning: limited resources -(18) and large class sizes -(13)

Eighteen studies across sub-Saharan Africa, India, Bangladesh, Burma and Cambodia reported on the limited or severe lack of textbooks and teaching and learning materials and their poor quality as overriding impediments to student learning. When there were enough resources, teachers also needed specific training in how to make full use of them (Altinyelken, 2010 H/H R; Ampiah and Mankoe, 2006 H/H EC; Barrett 2007 H/M EC; Conway et al., 2012 H/M Int; Geeves et al., 2006 M/H Int; Guzman et al., 2000 M/M Int; Hardman et al., 2008 H/H EC; ; Holland et al., 2012 M/M R; Lefoka and Sebatane 2003 H/H EC; Lall, 2011 M/M Int; Nakabugo et al., 2006 M/H EC; NCERT, 2011 H/H Int; Power et al., 2012 M/M int; Price-Rom and Sainazarov, 2010 M/M Int; Vavrus, 2009 M/H EC; Vavrus and Bartlett, 2012 H/H Int). These studies indicated that while teachers were aware of, for example, use of group work, they were hampered in their ability to fully implement this because of the lack of resources, so that group sizes of 12 or 20 were necessary to 'share' resources.

Even when teachers made an effort to make their own resources as in the study by Nakabugo et al. in Uganda, providing sufficient numbers with class sizes of over 150 was simply not possible. Thirteen studies, eight of them of mixed effectiveness, the other five reporting less effective practices, stated that having large numbers of children in cramped classrooms, often with immovable desks, mitigated against group work, with even pair work creating unacceptable and unworkable noise levels and reducing the amount of time teachers had for marking work (Ackers and Hardman, 2001 M/M EC; Alexander, 2001 H/H EC; Arbeiter and Hartley, 2002 H/H R; Atinyelken, 2010 H/H R; Barratt et al., 2007 M/H EC; Conway et al. 2012 H/M Int; Dyer, 2008 M/M EC; Guzman et al., 2000 M/M Int; Hardman et al., 2008 H/H EC; Kunje et al., 2002 M/H Int; Smith et al., 2005 H/H EC; Sarangapani, 2013 M/H EC; Vavrus, 2009 M/H EC; Vavrus and Bartlett, 2012 H/H Int). Trying to pay attention to so many learners, even for the most interactive teacher is difficult under these circumstances.

5.6 Conclusions

This review has found a mutually reinforcing cycle wherein teachers' positive attitudes towards their training and their students lead them to employ interactive communicative strategies and practices which lead to learning in their students. These teachers see teaching and learning as a two-way social process rather than seeing teaching as a delivery job only. This cycle is more likely to occur where the curriculum is aligned not only to the

students but with teacher education, itself focused back on the curriculum, on its teachers and on the immediate application of those new pedagogies in teachers' classrooms. Where classes are smaller in number and there are sufficient learning materials, this also makes practices more likely to work. Nevertheless, the cycle can exist even without these optimal factors.

The picture of pedagogical practices that emerged from the review is more positive than the review team had expected, if uneven within countries. The long-term effects of interventions and reforms that promote more social constructivist approaches seem, from the relative strength of the findings here, to be making some impact on some teachers, whether from their initial teacher education and CPD, from school curricula, or from the more recent, specific interventions that promote more prescribed forms of student- or child-centred learning, such as Schools for Life or ABL.

Overall the picture of effective practices in developing countries remains patchy and still inequitable. The problem facing governments and funders is how to upscale 'what works' in terms of higher student attainment more evenly at a national scale while recognising that the constraints of large classes and scarce resources are likely to remain the common experience for teachers and their students for some years yet, particularly with increasing numbers of students progressing to secondary school. With evidence of the paradigm shift towards more student-centred learning, the imperative now is to improve teachers' understanding and practices by a further shift towards students, their backgrounds, experiences, and current and potential levels of learning, and a more critical understanding of how the curriculum is aligned or not to students. Teacher education that conceptualises teaching and learning as essentially a communicative and social process, needing benign and encouraging teachers who know their own students' relationship to the curriculum, may be a starting point.

Education systems, and the Learning Metrics Task Force, working towards improving the educational experience of their teachers and students, would do well to look for success criteria in curricula and assessment modes that are attainable every day rather than distant unattainable benchmarks that may position teachers and their students as always failing. The review findings point to the importance of the daily visible impact that teachers make on their students that reinforces these six effective practices and hence learning. This is what quality education looks like.

6. Research gaps and future directions

This section pulls together the research gaps identified in Chapters 3-5 and discusses future research priorities in the light of these.

6.1 Research design

There were no studies that came up to the ‘gold standard’ of RCTs or experimental research, with treatment schools and control schools, which are more likely to be found in interventions of detailed reading programmes, for example. Evaluations of interventions sometimes started after the programme had begun and so researchers were observing and assessing the intervention rather than designing or manipulating the research. Inferential statistics were used to correlate specific practices with student cognitive attainment in the observational-analytical studies by Aslam and Kingdon (2011) and Nannyonjo (2007) yet while observations were used, details of how group work or quizzes were used were not reported, as it was teacher characteristics rather than their pedagogic practices that were the main focus. In Bhattacharjea et al. (2011), the breadth of the study, including students’ families, precluded a more detailed reporting of child-friendly practices. Observation-descriptive studies that drew on mixed methods and used standardised or national tests to measure the impact of interventions were more common, such as Arkorful (2012), NCERT (2011) or Hardman et al. (2009); they did give details of practice but did not always use baseline tests, so understanding the progression and learning over time of the same group of students was not captured. Qualitative studies that looked at reforms or existing conditions gave significant details of students, teachers, contexts and practices, on the other hand, such as Sharma (2013), Sarangapani (2013), Altinyelken (2010), Clarke (2003), Vavrus (2009) and Vavrus and Bartlett (2012), may not be in a position to systematically assess students’ learning - nor may this be their overall goal.

Future research designs could fruitfully combine qualitative with quantitative studies, for example with both baseline and post-tests measuring student attainment as a result of an intervention or reform, and systematic, structured classroom observation. Capturing students’ perspectives and experiences of school and classroom life should be prioritised in any study, as well as teachers’ understanding through focus group discussions and interviews. If the intervention or data collection is carried out over a solid time period of at least six months, baseline data can be correlated against teacher practices, progression both understood and measured at the end of a given time, and its sustainability determined after another six and twelve months later. Some implementation obstacles might be surmounted or new barriers may emerge in the long run or the impact of interventions or reform may not be sustainable after funding is withdrawn. Equally important would be to collect other indicators such as student discourse via recordings, their immediate understanding of a concept taught through their written responses and class tests, student participation in class (disaggregating participation by girls, marginalised students, disabled students), use and frequency of use of TLMs as well as attendance patterns over time. The measurement or indicator has to have construct validity: it has to accurately assess what the teacher intends the students to learn. As such, then, a combination of Arkorful’s (2012) qualitative approach, including participatory action research with students and national level standardised tests, the correlations of practices with student learning outcomes by Aslam and Kingdon (2011), and the investigation by Bhattacharjea et al. (2011) into students’ families can be seen as a guide for future research. Scale is important too: our criteria of six schools may be too small, and larger numbers of schools are needed to carry out descriptive and inferential statistics.

Observational-analytical studies looking at cohort data over three or four years in relation to pedagogic practices would show how reform or interventions work (or not) in altering practice in situ as Clarke (2003) did. Longitudinal studies investigating the build-up over five to ten years of national reforms and the influence of different interventions would perhaps give a different picture. For example, it would be interesting to explore the sustainability and effectiveness of the cluster-based mentoring system in Pakistan, reported in Hussain et al. (2007), now six years on.

RCTs are more difficult and costly but will give more precise findings of ‘what works’, for example, isolating the differences between learning outcomes in schools where teachers have been trained to use group work effectively with large classes and scarce resources, or better use of the one textbook, compared to similar schools where teachers have not had this very directed training. Using waiting control groups where teachers receive revised training following initial findings may make schools more willing to participate too.

Teacher self-report of their practices via questionnaire may not be all that reliable in describing actual practice; assessing teachers’ content and pedagogical content knowledge via questionnaire can be valid, as Bhattacharjea et al. (2011) and Akyeampong et al. (2013) did using classroom-based scenarios and tests, and comparing this to the assumed knowledge in the curriculum and as indicated in teachers’ actual practice.

6.2 Contexts

Schools: Further research situated in remote rural schools is needed with large classes and the uncertainties of teacher and student presence rather than in over-researched but more easily accessible urban schools. What is it, for example, that good schools with high attainment located in remote rural areas are doing?

Student characteristics: With few exceptions, the included papers do not report on the social, economic and cultural backgrounds of students’ homes in relation to pedagogy in detail. The relationship between the pedagogic practices being used and student home factors is important in understanding why, for example, teachers’ use of group work may not be viewed as ‘teaching’ by parents.

Students with disabilities: More research targeted on schools for students with disabilities or how such students are integrated into mainstream schools, such as Arbeiter and Hartley (2002) would fill a major gap. Detailed examples through multiple case studies of innovative and considerate practice of positive integration measures that challenge any negative views and teachers differentiating their practice for such students would be helpful.

Education and age level: A discernible gap was studies focusing on teachers’ practices at lower and upper secondary, looking at continuities with the primary curriculum and pedagogies. While some of the issues will be similar, teacher knowledge and approach will need to be of a different nature, in particular the remediation strategies that teachers have to use to support lower achieving students to prevent the spiral build-up of unlearned curriculum content. An odd gap that also emerged was the lack of comment by studies on the difficulties of having overage students in classes. Further studies could focus on how teachers positively handle such classes with overage students in the same grade and class.

Teachers’ characteristics: Few studies reported on the characteristics of teachers. For example, by and large the studies neither gave details of teachers’ qualification nor whether unqualified teachers were well-educated or under-educated. Likewise, distinction between more and less experienced teachers was seldom made. This lack of detail made it harder to make comparisons between different categories of teachers. Studies comparing experienced and novice teachers or studies looking at the transition novice teachers make

in becoming more effective, particularly through longitudinal qualitative investigation that focus on the conditions that support transition would fill a gap.

6.3 Pedagogy

Testing out review findings: The communicative strategies found in this review could feasibly be tested out, asking: What difference does directly teaching such communicative strategies have on teachers' practice, as this review hypothesises? What does this tell us about teachers' understanding of the pedagogy they try to use? Further studies could look, for example, at how teachers in large classrooms give feedback, how they record student work, and what use they make of this, which students they pay attention to, and which they do not. What do these strategies look like in upper secondary school, or in mathematics, science, life skills lessons? How familiar are teachers with their students' backgrounds, language, culture and levels of attainment? What difference does knowledge of their students' backgrounds and levels of attainment make on teachers' practices?

Group work: Few studies gave details of the kinds of tasks given to groups, how this fitted into the rest of the class and learning, the discourse used by students, the way in which teachers monitored and intervened in the groups and the kind and level of learning achieved by students as a result. How do teachers of large classes use group work really effectively is a key research question, building on from the study by Nakabugo et al. (2006).

Use of TLMs: Most studies reporting on existing conditions either found a lack of textbooks and TLMs or prescriptive use of textbooks. Case studies of effective practices in the use of textbooks, writing boards and the production and use of low-cost and homemade TLMs would be valuable. Experiments with different types of textbooks that have scripted lessons, a range of questions to ask students, or providing simple teacher guides to the textbook with sections to support teachers' content knowledge would be valid, as well as researching the economic implications of good or poor textbook design and use. How do textbooks support or constrain teachers in planning varied lessons? How well does the textbook communicate the values and outcomes of the curriculum?

Demonstration and explanation: Further research on how teachers increase their content knowledge, and its relation to practices and student outcomes is needed to strengthen the evidence base here. Studies could isolate teachers' use of demonstration and explanation and assess teachers' and students' (mis)understanding of the concept being taught through their written or verbal responses as no study explicitly made this connection.

6.4 Teacher education

Impact of teacher training: Irrespective of whether studies looked at CPD, ITE or training unqualified teachers, with few exceptions investigations of the effectiveness of training did not take a holistic view of pedagogy as constituting teachers' thinking, including their knowledge, both content and PCK, their practices and the impact of these on students' outcomes. Studies such as the MUSTER studies (Lewin and Stuart, 2003) and Teacher Preparation in Africa project (TPA) (Akyeampong et al., 2013) looked at the impact of teacher education on the practices of NQTs, with a narrower focus on early reading and mathematics in TPA but without also systematically collecting data on student learning outcomes. Identifying further examples of effective practice could also have been undertaken. A similar research programme looking at lower secondary mathematics, science and reading, for example, might be worth considering, across a variety of countries and regions.

Teacher educators: Although several studies highlighted the need for training teacher educators, the review did not identify many studies looking specifically at how they are

trained and inducted, how they develop their own practice and PCK over time or how they develop a community of practice through collaboration in networks and individual and collective reflection. Research looking at innovative uses of teacher educators using observations of teachers identified as effective with their student teachers, or using video-clips of such practice and using it themselves with their students, would be valuable and inexpensive to design and implement.

Follow-up classroom and peer support: Research that gives further details of training and follow-up classroom support including the management and administrative structures that helped to make it possible for this take place, particularly in difficult conditions, would be valuable. Further research is needed to take a longer view of how peer support works, perhaps over a year, and an analysis of the factors that support successful peer support, as evidenced in teachers' practices, beliefs and motivations, and student achievements. How wide-scale peer support is within a region or country and its precise impact on teacher practices and student outcomes would be valuable. Knowledge of the cost-effectiveness of peer support in comparison to other forms of professional development would support funders in determining monetary priorities.

6.5 Curriculum and assessment

Although the alignment between curriculum and modes of assessment emerged as a factor that facilitates teacher pedagogic practice, few studies analysed the forms of assessment, both formative and summative, that teachers used in relation to the curriculum. Studies using a mixed methods approach to understand assessment practices and their relationships to pedagogy and student learning over time would fill this gap. For example, what is the impact of school or national examinations on the pedagogic practices of teachers in comparison to when these are absent or there is continuous assessment? What levels of learning take place in these classrooms? Further questions might be: What are the processes of curriculum design undertaken in different countries? To what extent are teachers encouraged to participate in curriculum design?

6.6 Dissemination and research impact

Finally, how research findings are disseminated within a country is not always well known or understood. Examples of how a particular piece of research directly impacts on teachers' practices or on policy and then practice would be of considerable interest, particularly the lines of communication and the different kinds of stakeholders and actors involved.

7. Reflections on the review process

The terms of reference of this rigorous review set the task of providing a far-reaching review of the evidence base regarding teacher education, teaching practice, pedagogy and the curriculum in developing countries, within a limited time frame. Because of the size of these topics - and the fact that rigorous reviews are intended to take a more inclusive approach to evidence than a systematic review might - it was necessary to agree a way to focus the priorities of the review. The approach decided upon, in discussion with the DfID, was to put pedagogic practice at the centre of the review; other aspects of pedagogy, teacher education and the curriculum were considered in the review insofar as they contributed to, or affected, pedagogic practice. While this was the right focus, in retrospect, having to develop and operationalise research questions in ways that would encompass such a wide field was time consuming and it might be helpful for future reviews, rigorous or otherwise, to be smaller in scope and to have a precise focus and indeed question, which can be completed relatively rapidly to support research agendas.

Our approach revealed how little attention is often paid in the published literature to the details of how pedagogy is implemented in practice. While some studies discussed how a particular theoretical approach (e.g., child-centred education, social constructivism) translated into practice, many made passing references to such theories without it being clear how (or whether) they were actually implemented in consistent or meaningful ways. Some seemed to use terms such as 'active learning' or 'student-centred' as catch-all labels, assuming that they were understood and enacted uniformly by educators and teacher trainers across different settings and countries, although it soon became clear from reading the papers that this was not the case. This posed a challenge to the review in gathering evidence for or against a particular theoretical approach, and ultimately led us to focus more on pedagogic practices than theoretical labels. This is in keeping with the definition of pedagogy used by the review, which insists on 'the observable act of teaching' (Alexander 2007) as an integral element in conjunction with the theories, values, evidence and beliefs which also make up the concept. However, disaggregating details of pedagogic practices from the overall study and context in which they were implemented was a necessary but difficult process. We had to synthesise how a particular practice was implemented across a number of studies and find the commonalities, but keep in mind the material conditions in which it took place, who the teachers were, and how curriculum and teacher education enabled teachers to use this practice or hindered them. This approach therefore ran the risk of minimising context over abstracted practice. We hoped that by signalling the country and type of study, this could be mitigated. The alternative was to look at each study holistically to see which set of practices seemed to result in higher student attainment. Such an approach would have highlighted interventions with their pedagogic packages which the evidence suggests are not easily replicable - and are costly. It would also have missed the more interesting studies of reforms and existing conditions that reported mixed results, where some teachers used some practices relatively well. Pedagogy is complex, however, and we hope that in presenting such details of strategies, practices and facilitating factors, this is of more interest and help to programme officers on the ground, and in identifying research gaps that emerge from this, this review will support future research and project trajectories within the DfID.

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Appendices

Appendix 1: Authorship and acknowledgements

Authors

Dr Jo Westbrook, Centre for International Education, University of Sussex

Dr Naureen Durrani, Centre for International Education, University of Sussex

Rhona Brown, Centre for International Education, University of Sussex

Dr David Orr, School of Education and Social Work, University of Sussex

Dr John Pryor, Centre for International Education, University of Sussex

Dr Janet Boddy, School of Education and Social Work, University of Sussex

Francesca Salvi, Centre for International Education, University of Sussex

Contact details

Jo Westbrook
School of Education and Social Work
Essex House
University of Sussex
Falmer
Brighton
BN1 9RH
United Kingdom
E-mail: jlw24@sussex.ac.uk
Tel: + 44 (0) 1273 877326

E-user Group membership

Helen Abadzi	Global Partnership for Education
Kingsley Arkorful	Education Development Centre Inc., Schools for Life, Ghana
Charles Gahima	Rwanda Teachers' College, Rwanda
Robinah Kyeyune	Department of Language Education, School of Education, Makerere University, Kampala
Bob Moon	Research Group on International Development in Teacher Education, The Open University
Helen Pinnock	Independent consultant, UK
Mariko Shiohata	Save the Children, Nepal
Arathi Sriprakash	Faculty of Education and Social Work, University of Sydney

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Appendix 2: Search strategy

The search strategy attempted to locate papers which focused on:

(1): Focus Area - the review's main areas of interest (pedagogy, teacher education, teaching practice and curriculum), in relation to

(2): Level of Education - primary and secondary schooling in

(3): Geographical Region - low- and middle-income countries (according to the World Bank classification: <http://data.worldbank.org/>).

In Europe and the countries of the former Soviet Union, only the low-income countries Kyrgyz Republic and Tajikistan were included in the search, as the middle-income countries in these regions generally have a legacy of highly developed educational systems.

Although the prototype strategy shown below underwent minor modifications to suit the differing characteristics of each individual database, database searches followed this pattern wherever possible (some databases could only cope with much shorter searches):

Focus area: pedagog* or "teaching practice*" or "teaching method*" or "teaching style*" or "teaching strateg*" or "direct instruction" or "explicit instruction" or "guided instruction" or "discovery learning" or "child cent*d" or "child friendly" or "learner-cent*d" or "learning-cent*d" or "student cent*d" or "activity based" or "structured teaching" or "guided learning" or "guided practice" or "instructional method*" or "instructional effectiveness" or "classroom practice*" or "classroom interaction" or "classroom discourse" or "instructional technique*" or "instructional approach*" or "active learning" or "participatory method*" or "participatory technique*" or "participatory teach*" or "supported learning" or "accelerated learning" or "school for life" or "complementary education" or "teacher educat*" or "teacher train*" "teacher learning" or "ITE" or "professional development" or "CPD" or "in-service" or "INSET" or "peer coach*" or "peer mentor*" or "teacher mentor*" or "teacher coach*" or "teacher upgrading" or "school-based training" or "classroom-based training" or curricul* or "outcomes-based education"

AND

Level of education: "primary school*" or "primary education" or "primary teach*" or "primary classroom*" or "elementary school*" or "elementary education" or "secondary school*" or "secondary education" or "secondary teach*" or "secondary classroom*" or "high school*" or "compulsory education" or "basic education" or "K12" or "home education" or "non-formal education" or "non-formal learning" or "non-formal school*" or "out-of-school children"

AND

Geographical region: "low-income countr*" or "middle-income countr*" or "lower middle income" or "upper middle income" or LMIC or "developing countr*" or "developing nation*" or "global south" or LDC or "underdeveloped countr*" or "underdeveloped nation*"

OR Afghanistan OR Algeria OR Angola OR Antigua OR Barbuda OR Argentina OR Aruba OR Bahrain OR Bangladesh OR Barbados OR Benin OR Belize OR Bhutan OR Bolivia OR Botswana OR Brazil OR Brasil OR "Burkina Faso" OR "Burkina Fasso" OR "Upper Volta" OR Burundi OR Urundi OR Cambodia OR "Khmer Republic" OR Kampuchea OR Cameroon OR Cameroons OR "Cape Verde" OR "Central African Republic" OR Chad OR Chile OR China OR Colombia

OR Comoros OR “Comoro Islands” OR Comores OR Mayotte OR Congo OR Zaire OR “Costa Rica” OR “Cote d’Ivoire” OR “Ivory Coast” OR Cuba OR “Djibouti” OR “French Somaliland” OR Dominica OR “Dominican Republic” OR “East Timor” OR “East Timur” OR “Timor Leste” OR Ecuador OR Egypt OR “United Arab Republic” OR “El Salvador” OR Eritrea OR Ethiopia OR Fiji OR Gabon OR “Gabonese Republic” OR Gambia OR Gaza OR Ghana OR “Gold Coast” OR Grenada OR Guatemala OR Guinea OR Guam OR Guiana OR Guyana OR Haiti OR Honduras OR India OR Maldives OR Indonesia OR Iran OR Iraq OR Jamaica OR Jordan OR Kenya OR Kiribati OR Korea OR Kyrgyzstan OR Kirghizia OR “Kyrgyz Republic” OR Kirghiz OR Kirgizstan OR “Lao PDR” OR Laos OR Lebanon OR Lesotho OR Basutoland OR Liberia OR Libya OR Madagascar OR “Malagasy Republic” OR Malaysia OR Malaya OR Malay OR Sabah OR Sarawak OR Malawi OR Nyasaland OR Mali OR “Marshall Islands” OR Mauritania OR Mauritius OR “Agalega Islands” OR Mexico OR Micronesia OR “Middle East” OR Mongolia OR Morocco OR Ifni OR Mozambique OR Myanmar OR Myanma OR Burma OR Namibia OR Nepal OR Antilles OR “New Caledonia” OR Nicaragua OR Niger OR Nigeria OR “Mariana Islands” OR Oman OR Muscat OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Philipines OR Phillipines OR Phillippines OR “Puerto Rico” OR Rwanda OR Ruanda OR “Saint Kitts” OR “St Kitts” OR Nevis OR “Saint Lucia” OR “St Lucia” OR “Saint Vincent” OR “St Vincent” OR “Grenadines” OR “Samoa” OR “Samoan Islands” OR “Navigator Island” OR “Navigator Islands” OR “Sao Tome” OR “Saudi Arabia” OR Senegal OR Seychelles OR “Sierra Leone” OR “Sri Lanka” OR “Solomon Islands” OR Somalia OR Sudan OR Suriname OR Surinam OR Swaziland OR Syria OR Tajikistan OR Tadjikistan OR Tadjik OR Tanzania OR Thailand OR Tibet OR Togo OR “Togolese Republic” OR Tonga OR Trinidad OR Tobago OR Tunisia OR Uganda OR Vanuatu OR “New Hebrides” OR Venezuela OR Vietnam OR “Viet Nam” OR “West Bank” OR Yemen OR Zambia OR Zimbabwe OR Jamahiriya OR Jamahiryria OR Libia OR Mocambique OR Principe OR “Indian Ocean” OR Melanesia OR “Western Sahara”

Appendix 3: Search sources

The following **databases** were searched:

Australian Education Index (AEI)	Psychinfo
British Education Index (BEI)	3ie Impact Evaluation
British Library for Development Studies (BLDS)	UNESCO
ERIC	World Bank publications database
Index to Theses	

Volumes from 2000-2013 of the following **key journals** were handsearched:

<i>International Journal of Educational Development</i>	<i>Assessment in Education</i>
<i>Comparative Education Review</i>	<i>Gender and Education</i>
<i>Comparative Education</i>	<i>Gender and Development</i>
<i>Compare</i>	<i>British Journal of Special Education</i>
<i>Teaching and Teacher Education</i>	<i>International Journal of Disability Development and Education</i>
<i>Journal of Curriculum Studies</i>	<i>International Journal of Inclusive Education</i>
<i>The Curriculum Journal</i>	<i>International Review of Education</i>
<i>Language Culture and Curriculum</i>	<i>International Journal of Educational Research</i>
<i>Journal of Education and Teaching</i>	

The following **websites** were searched:

http://www.acdi-cida.gc.ca/home	http://r4d.dfid.gov.uk/
http://www.actionaid.org.uk	http://www.savethechildren.org.uk/
http://www.adeanet.org	http://www.sida.se/English/
http://www.ausaid.gov.au	http://www.unesco.org/new/en/
http://www.eldis.org/	http://www.unicef.org/
http://oxfam.org.uk/	http://www.usaid.gov/
http://www.pratham.org/	http://www.vsointernational.org
http://research.brac.net/	

Supplementary searches were done using Google Scholar in non-English languages in which the team have expertise: French, Spanish and Urdu.

Appendix 4: Coding set for mapping

1. Income level

- Low income
- Lower middle income
- Upper middle income

2. Region

- Sub-Saharan Africa
- North Africa and Middle East
- Central Asia
- South Asia
- East Asia and Pacific
- Latin America and Caribbean

3. Country of Focus

4. Empirical data?

- First-hand empirical data
- No first-hand empirical data

5. Level of Education

- Primary
- Lower secondary
- Upper secondary
- Primary and Secondary

6. Topic(s) for Review

Pedagogy

- Pedagogy as practice
- Pedagogy as ideas/beliefs

Pedagogical strategy being used

Briefly outline characteristics of pedagogy described in the study. Consider the following: teacher and pupil discourse; social interaction; lesson/ learning objectives; the nature of tasks provided and encountered; class activities undertaken to address tasks; pupil organisation such as pairs, groups, individually or a whole class (and the role of the teacher); time spent on different tasks/stages; curricular 'fit'; teaching and learning materials and their use; managing the learning environment; monitoring and assessment of learning.

Reference to pedagogical theory

Write short note if specific school of thought/broad pedagogical theory is explicitly cited e.g. social constructivism.

Pedagogical 'label' given?

- No
- Yes (if yes, choose from one of the listed approaches: direct/ explicit instruction; structured pedagogy; teacher-centred/ teacher-led; activity-based learning; student/learner-centred; child-centred; indigenous pedagogy; critical pedagogy; other please specify)

Teacher Education

- ITE
- CPD (Qualified teachers; Untrained teachers; Para teachers; Contract teachers)
- Teacher educators
- Support and supervision

Curriculum

- Curriculum model (Briefly say what curriculum model is described if it is explicitly stated or quickly apparent, e.g. content driven, process driven, objective/outcomes-based, national, localised, alternative, other)

7. Curricular subject

- general (specific subject not given)
- mathematics
- language
- science
- humanities
- life skills
- ICT (not as method of teaching other subject but ICT itself)
- Other (please specify)

8. Is there a specific focus on gender and equity?

- No
- Yes (select from: gender; disability; socio-economic status; rural/remote area; ethnic minority; linguistic minority; religious minority; other)

9. Site of practice

NB. this could involve student, student teacher or qualified teacher doing PD

- Primary school
- Secondary school
- Teacher training college
- Home
- Community centre
- Other

- Multiple

10. Specific Context/target group of children

- Disadvantaged areas
- Rural schools
- Urban schools
- Private schools
- Multigrade classes
- Post-conflict/ Refugees
- Girls
- Disabled children
- Other
- Multiple

11. What does the study report on? (select more than 1 if necessary)

- Intervention (practice level)
- Reform (policy level)
- Existing conditions
- Other
- Not applicable e.g. theoretical papers

12. Aim of intervention/reform etc. (above)

Write brief bullet points

13. Geographical spread of programme

- sub-national
- national
- international

14. Scale of intervention/ programme

Briefly write in text box e.g. number of schools, number of teachers

15. Scale of Study

Briefly write in text box e.g. number of schools, number of teachers

16. Donor Support

- No/not mentioned
- Yes
- Who?
 - Bilateral agency e.g. DfID, USAid
 - Multilateral agency e.g. UN, World Bank,
 - NGO

- Religious Group
 - Philanthropic trust
 - Other
- Nature of support
 - funding
 - training
 - infrastructure
 - monitoring
 - material resources
 - other

17. Outcomes

- Learning outcomes
 - cognitive e.g. change in assessment results
 - creative/ emotional e.g. change in confidence, participation, change in values/ beliefs (consider citizenship, peace-building, inclusion, equity)
 - social e.g. change in pupil- teacher relations
- Other outcomes
 - pupil attendance
 - use of resources
 - use of specific practice(s)
 - inclusion of marginalised groups
 - stakeholder satisfaction
 - other

18. Reasons advanced for success/lack of success

Appendix 5: Data extraction and quality assessment tool for in-depth review

Date of review	
Date of publication	
1. Please describe the study's aims, objectives and underpinning rationale	Details
2. What are the study research questions and/or hypotheses?	Details
3. Please describe briefly the intervention, with which the study is concerned.	Details
4. Which variables or concepts, if any, does the study aim to measure or examine?	Please specify
5. Are comparisons made between two or more groups, or within a group (e.g., a before-and-after intervention)?	Between two or more groups Within group Other (please specify)
6. Please describe the participants in this study, stating how many there were and their characteristics e.g. gender, ethnicity, age, level of professional attainment, etc.?	
7. Are equity issues considered? If so, please specify.	
8. Which were the main types of data collected, and please specify how these were used e.g. to measure/monitor aspects of the intervention	
9. What are the main methods of analysis, including statistical procedures, used in the study?	
10. Please summarise the results - positive and negative	
11. What were the facilitating/enabling factors?	
12. What were the barriers?	
13. What do the authors conclude from the study?	
14. Are these conclusions justified from the evidence/findings?	
15. Do the authors report on their own relationship to the intervention studies?	
16. How generalisable are the findings?	
17. Are there ethical concerns about the way the study was conducted or reported?	

Weight of Evidence

Methodological Trustworthiness (Weight of Evidence A)

Taking into account the clarity of reporting in the study, the appropriateness of study design and methodological rigour, and the extent to which the authors' conclusions are justified by the findings reported, what is the overall weight of evidence this study provides to answer the final question of this review?

- High trustworthiness (please specify)
- Medium trustworthiness (please specify)
- Low trustworthiness (please specify)

Quality of Contextualisation (Weight of Evidence B)

Quality of contextual detail given to support generalisability, replication or upscaling (including the detail of educational setting, details of factors facilitating change/success, barriers to change/success).

In the sample, what is the overall context-specific weight of evidence this study provides to answer the final question of this review?

- High robustness (please specify)
- Medium robustness (please specify)
- Low robustness (please specify)

Data extraction tool adapted from the EPPI-Centre's template: see <https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=184> for further information

Appendix 6: Overview of studies included in the in-depth review

	←HIGH/HIGH	HIGH/MODERATE	MODERATE/MODERATE	MODERATE/LOW	LOW/LOW →
<p>↑</p> <p>EFFECTIVE</p> <p>↓</p>	<p>Arkorful (2012) Ghana INT Pr</p> <p>Leach (2004) Egypt INT Pr</p> <p>Saigal (2012) India INT Pr</p> <p>Sharma (2013) India EC Pr</p>	<p>Aslam and Kingdon (2011) Pakistan EC Pr/LS</p> <p>Geeves et al. (2006) Cambodia INT Pr</p>	<p>Hussain et al. (2007) Pakistan INT Pr (One additional paper on the same study)</p> <p>Kelani and Khourey-Bowers (2012) Benin INT US</p> <p>Nannyonjo (2007) Uganda EC Pr</p> <p>Power et al. (2012) Bangladesh INT Pr/LS/US (Two additional papers on the same study)</p> <p>Price-Rom and Sainazarov (2010) Kyrgystan INT Pr</p> <p>Vithanapathirana (2006) Sri Lanka INT Pr</p>	<p>Chavan (2003) India INT Pr</p>	<p>Agrawal (2004) India R US</p> <p>Sharmin and Roy (2011) Bangladesh INT LS</p> <p>Shohel and Banks (2012) Bangladesh INT Pr/LS</p>
<p>↑</p> <p>MIXED</p> <p>↓</p>	<p>Altinyelken (2010) Uganda R Pr (Two papers on one study)</p> <p>Arbeiter and Hartley (2002) Uganda R Pr</p> <p>Clarke (2003) India R Pr</p> <p>Coffey International (2012) Ghana INT Pr</p> <p>Hardman et al. (2009) Kenya INT Pr</p> <p>NCERT/SSA (2011) India</p>	<p>Barrett. (2007) Tanzania EC Pr</p> <p>Conway et al. (2012) Uganda INT LS</p> <p>Khamis (2011) Somalia INT Pr</p> <p>Kunje et al. (2003) Malawi INT Pr (One additional paper on the same study)</p>	<p>Guzman et al. (2000) Lao INT Pr</p> <p>Holland et al. (2012) Uganda R Pr</p> <p>Lall (2011) Burma INT Pr</p>	<p>Blum (2009) India INT Pr</p> <p>UNICEF (2008) India INT Pr</p>	<p>Grimes et al. (2011) Lao PDR R Pr/LS/US</p>

	INT Pr (A further two papers on the same study) Vavrus and Bartlett (2012) Tanzania INT US	Nakabugo et al. (2006) Uganda EC Pr Sarangapani et al. (2013) India EC Pr Vavrus (2009) Tanzania EC LS/US			
↑ LESS EFFECTIVE ↓	Alexander (2001) India EC Pr Akyeampong (2003) Ghana EC Pr Ampiah and Mankoe (2006) Ghana EC Pr/LS Bhattacharjea et al. (2011) India EC Pr Hardman et al. (2008) Nigeria EC Pr Hardman et al. (2012) Tanzania EC Pr Lefoka and Sebatane (2003) Lesotho EC Pr Pontefract and Hardman (2005) Kenya EC Pryor et al. (2012) multi EC Pr (One additional paper on the same study) Smith et al. (2005) India EC Pr	Ngware et al. (2012) Kenya EC Pr Singal (2008) India EC Pr	Ackers and Hardman (2001) Kenya EC Pr Alhassan and Adzahlie-Mensah (2010) Ghana EC Pr C Pr Dyer (2008) India EC Pr Nsibande and Modiba (2012) Swaziland EC	Dyer et al. (2004) India R Pr Sriprakash (2009) India R Pr	KEY INT = intervention R = reform EC = existing conditions Pr = primary LS = lower secondary US = upper secondary

Appendix 7: Summary table of interventions, reforms and existing conditions according to effective strategies and practices identified by each study

		Practices						Strategies		
	Country	Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Most effective pedagogies										
Arkorful (2012) H/H INT Primary Scale: 100,000 students	Ghana	✓	✓	✓	✓	✓	✓	✓	✓	✓
Leach (2004) H/H INT Primary Scale: 24 teachers	Egypt			✓			✓		✓	
Saigal (2012) H/H INT Primary Scale:14 teachers	India	✓						✓	✓	
Sharma (2013) H/H EC Primary Scale: 23 then 5 teachers	India	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aslam and Kingdon (2011) H/M EC Secondary Scale: 50	Pakistan				✓		✓	✓	✓	

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
schools, 100 teachers, 1,410 students										
Geeves et al., (2006) M/H INT Primary Scale: 29 schools	Cambodia	✓		✓	✓	✓		✓	✓	✓
Hussain et al. (2007) M/M INT Primary Scale: 34,000 teachers	Pakistan			✓			✓			
Nannyonjo (2007) M/M EC Primary Scale: 338 teachers, 3,994 students	Uganda	✓			✓		✓	✓		
Vithanapathirana (2006) M/M INT Primary (multigrade) Scale: 10 schools	Sri Lanka						✓			
Power et al. (2012) M/M INT Primary/Lower Sec	Bangladesh	✓		✓	✓			✓		

Appendix 7: Summary table of interventions, reforms and existing conditions according to effective strategies and practices identified by each study

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Scale: 690 English teachers from 300 schools										
Price-Rom and Sainazarov (2010) M/M INT Primary Scale: National curriculum reform	Kyrgyzstan		✓							✓
Kelani (2009) M/M INT Upper Secondary Scale: 51 teachers	Benin				✓				✓	
Mixed effectiveness										
Coffey International (2012) H/H INT Primary Scale: Schools for Life in Northern Uganda	Ghana	✓		✓	✓			✓		

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Hardman et al. (2009) H/H INT Primary Scale: SbTD programme reached over 47,000 primary school teachers	Kenya	✓	✓	✓	✓	✓		✓		
National Council of Educational Research and Training (2011) H/H INT Primary Scale: ABL initiative was up-scaled to about 37,500 schools, all run by Tamil Nadu state government	India	✓	✓	✓		✓	✓	✓		✓
Vavrus and Bartlett (2012) H/H INT Upper Secondary Scale: National	Tanzania	✓	✓							

Appendix 7: Summary table of interventions, reforms and existing conditions according to effective strategies and practices identified by each study

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Atinyelken (2010a, b) H/H R Primary Scale: National	Uganda	✓	✓	✓	✓		✓			
Clarke (2003) H/H R Primary Scale: 226 districts in 18 states	India		✓	✓				✓	✓	✓
Arbeiter and Hartley (2002) H/H R Primary Scale: National Reform	Uganda		✓					✓		
Khamis (2011) M/H INT Primary Scale: National	Somalia	✓				✓		✓	✓	✓
Barrett (2007) H/M EC Primary Scale: 32 interviews in 18 schools in 4 districts	Tanzania	✓		✓				✓	✓	✓

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Kunje (2002) and Kunje et al. (2003) M/H INT Primary Scale: National	Malawi				✓					
Nakabugo et al. (2006) M/H EC Primary Scale: 35 teachers in 20 schools	Uganda	✓	✓	✓	✓	✓		✓		
Conway et al. (2012) H/M INT Lower Secondary Scale: National	Uganda		✓		✓			✓		
Sarangapani et al. (2013) M/H EC Primary Scale: 85 schools	India		✓					✓	✓	✓

Appendix 7: Summary table of interventions, reforms and existing conditions according to effective strategies and practices identified by each study

	Country	Practices						Strategies		
		Group and pair work	Demonstration, explanation	Teaching and learning materials	Questioning	Local languages	Planning and lesson structure	Feedback, individual attention and inclusion	A safe and supportive environment	Drawing on students' background
Vavrus (2009) M/H EC Lower/upper secondary Scale: course delivered in 1 college reflecting national ITE curriculum	Tanzania	✓			✓			✓		
Holland et al. (2012) M/M R Primary Scale: National	Uganda					✓		✓		
Guzman et al. (2000) M/M INT Primary Scale: 4,000 teachers in 48 districts	Lao PDR		✓	✓	✓					
Lall (2011) Primary M/M INT Scale: 196,458 students in monastic schools	Burma	✓							✓	

Appendix 8: Summary table of studies with details of study aims and methods used

STUDIES REPORTING POSITIVE OUTCOMES

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Arkorful (2012) Primary	H/H	Ghana	To understand the links between SfL curriculum and formal school curriculum and how students from the SfL programme integrate into formal education	Observational - descriptive: Interviews, observation, participatory action research, standardised student test scores	INTERVENTION Schools for Life (SfL) Complementary Education Programme for marginalised children in rural areas Scale of intervention/reform: Operating for previous 15 years; over 100,000 children participated. EQUALL project operational in 9 districts of northern Ghana, 26,250 children from 2004-10 with 22,000 transitioned into formal education sector. Scale of study: 10 SfL feeder schools and 2 formal primary schools	Positive: curriculum functional and relevant to children, scripted guidelines, local language, flexible groupings, questioning and responses, board work, reading, SfL graduates successfully integrated into formal system. Negative: No formal assessment of students No mention of formal school curriculum or whether teaching in English makes integration more difficult
Leach (2004) Primary	H/H	Egypt and South Africa	To investigate and help develop the use of ICT in primary school education in	Observational - descriptive: Qualitative survey research including questionnaires , diaries,	INTERVENTION Digital Education Enhancement Project (DEEP) project focusing on professional development of primary teachers to integrate ICT-enhanced activities into	Positive: Teachers learnt to use hand-held computers and pocket cameras confidently and quickly, integrated use of ICT, use of group work and co-operative learning, student achievement in literacy and science, increase in

Appendix 8: Summary table of studies with details of study aims and methods used

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			Egypt and South Africa (SA) with a focus on teacher development	interviews, classroom observations, technically derived 'histories' of equipment use, correspondence	teaching Scale of intervention/reform: 12 schools in SA and 12 in Egypt Scale of study: 12 schools in SA and 12 in Egypt	attendance, changes in teacher thinking
Saigal 2012 Primary	H/H	India	To examine how the Quality Education Programme processes of teacher professional development were being experienced in Baran schools	Observational - descriptive: Multiple case studies - observations, in-depth interviews	INTERVENTION Specialist advisers work in class with teachers on pedagogical strategies, modelling/advising Scale of intervention/reform: 14 teachers Working with rural students and those from Scheduled Tribes, study was included on contingent criteria as part of a larger study of 6 schools	Positive: Cessation of corporal punishment, instruction tailored to individual needs, group work, respect for teachers, alteration of practices
Sharma (2013) Primary	H/H	India	To identify effective teachers' beliefs and understanding about their	Observational - descriptive: Observations and in-depth interviews	EXISTING CONDITIONS Scale of intervention/reform: 23 teachers initially observed, then 5 demonstrating the effective pedagogies identified Scale of study: From 23	Positive: Commitment to redress social inequalities in practice, lesson planning, higher order questions, using materials beyond textbooks, examples of discrimination in life use of discussion, students

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			pedagogy		teachers in 10 different government schools to 5 in-depth case studies of teachers working with poorest children, those from Scheduled Tribes, Dalits, girls	and teachers asking a variety of questions from recall to critical reasoning, focusing on quiet students, students worked in mixed ability pairs/groups
Aslam and Kingdon (2011) Secondary	H/M	Pakistan	To identify the teacher characteristics and practices that contribute most to pupil achievement	Observational - analytical: Questionnaires , measurements of pupils' arm circumference , height and weight, tests of numeracy and literacy	EXISTING CONDITIONS Identifying relationships between teachers' characteristics/reported practices and students learning outcomes Scale of study: 50 schools (34 private, 16 government); all in Lahore. 100 teachers 1410 students (grade 8) with a focus on girls	Positive: Students' achievement as measured by literacy and numeracy tests affected by teaching 'process' variables of lesson planning, questioning students on previous knowledge across school types Teachers' qualification or certification not found to be related to students' achievement but girls benefitted from female teachers. Across sectors, better schools hire 'effective' teachers; in government sector, 'effective' teachers are those with good English language skills and those who spend more time quizzing students, schools adopt incentive mechanisms to discourage moonlighting; in

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
						private schools, 'effective' teaching rests on methodology that encourages testing and the use of interactive approaches
Geeves et al. (2006) Primary	H/M	Cambodia	To evaluate the Public Education for Disadvantaged Children project in terms of the progress, outcomes and impact	Observational - descriptive: Interviews, observations, statistics collected from schools. Structured and semi-structured interviews with officials at different levels and with small groups of stakeholders at school and community level	INTERVENTION Project aim: Increasing access to primary schooling for marginalised students and girls and improvement of quality of management and teaching and learning Scale of intervention/reform: 154 primary schools Scale of study: Team members visited the Provincial Education Office (PEO), the seven District Education Offices (DEOs) and 29 of the 154 schools in the province during ten days of field work.	Positive: Greater enrolment (marginalised and girls), greater use of child-centred and co-operative methods, use of alternative approaches to rigid grade separation, happy and active students, use of pair/group work with whole-class/individual presentations, teachers sharing practices Negative: Teacher self-assessment booklet overly complex, problems with textbook distribution for some classes and with creating material in minority languages
Hussain et al. (2007) Primary	M/M	Pakistan	To evaluate the effectiveness of cluster-based mentoring	Observational - descriptive: Case study - focus group interviews, observations,	INTERVENTION Cluster Based Mentoring Programme for improving teaching quality in primary schools	Positive: Mentors replicated training well, increase in subject knowledge, lesson planning and the development and use of low-cost teaching, interactive and enjoyable

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			programme in two of Pakistan's provinces	reflective journals, workshop evaluations, statistical data collected by district offices	Scale of intervention/reform: An estimated 34,000 teachers and administrators were the target group for enhancing their professional training through in-service programme Scale of study: 395 schools; 40 mentors; 305 mentees	lessons, change in students' learning
Kelani (2009)	M/M	Benin	To explore teachers' self-efficacy beliefs to teach technology education. Practical aim: to provide Benin secondary school physical science teachers with an effective TPD programme	Observational - descriptive: Observations (after intervention and training), teacher journals, interviews, session evaluations	INTERVENTION Teacher Professional Development (TPD) programme for science teachers Scale of intervention/reform: 51 secondary school science teachers, qualified, mix of government and private schools	Positive: increase in teachers' self-efficacy, improvement in teachers' content knowledge, teachers became proficient in using educational technology in classrooms, students reported improved quality of lessons post-intervention

Appendix 8: Summary table of studies with details of study aims and methods used

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Nannyonjo (2007) Primary	M/M	Uganda	To review the effectiveness in the use of resources in primary schools in Uganda as measured by student achievement scores	Observational - analytical: Standardised tests, questionnaires	EXISTING CONDITIONS Relating to effective use of school inputs and factors associated with students' learning achievement, focus on girls Scale of study: 338 teachers, 3,994 grade 6 students in government and private schools, 200 headteachers	Positive: High student scores associated with 'process' variables of monthly tests, daily homework with feedback, asking questions and useful feedback, monitoring groups, giving remedial classes, teacher subject knowledge, commitment, interest and collegiality have a positive relationship with students test scores, hard inputs of desks, trained teachers, teachers' qualification with exception of a higher degree and larger classes had little/no impact. Negative: Students repeating schools years does support them in improving learning
Power et al. (2012) Primary/ lower-secondary	M/M	Bangladesh	To examine the School Based Teacher Development model (English in Action) being used in Bangladesh, for primary	Observational - analytical: Quantitative survey using observation	INTERVENTION English in Action is a nine-year project beginning in May 2008 and running through to 2017, designed to assist 25 million people in Bangladesh to improve their English language skills Scale of intervention/reform: Pilot phase of English in Action	Positive: Lessons observed were more interactive and communicative, teachers and students talk in English increased, students' assessed proficiency in English improved

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			and secondary English language teachers		<p>- 600 government English teachers (from 300 schools) and 90 English teachers from non-governmental school 2008-11</p> <p>Scale of study: The sample size used in 2010 covered 79% of the teachers participating in the project and 54% (49% primary and 65% secondary) in 2011</p>	
<p>Price-Rom and Sainazarov (2010)</p> <p>Primary</p>	M/M	Kyrgyzstan	To examine active-learning pedagogies as a key aspect of educational reform in the Republic of Kyrgyzstan	Observational - descriptive: Case reviews, existing documentary/ statistical data, focus groups, interviews	<p>INTERVENTION</p> <p>Several projects funded by USAID focused on teacher professional development and moving towards active-learning pedagogies, with a focus on both urban and rural schools, disabled students</p> <p>Scale of intervention/reform: national reform</p> <p>Scale of study: Overall, 105 teachers attended the focus group discussions in seven provinces (9 from each of the project schools and 6 from each of the control group schools). 70 school administrators (head teachers etc.) Questionnaires were collected from 530</p>	<p>Positive: Teachers reported more knowledge of new active learning methods</p> <p>Negative: Teachers have varying interpretations of active-learning methods</p>

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
					teachers in seven oblasts (provinces)	
Vithanapathirana (2006) Primary (multigrade)	M/M	Sri Lanka	To evaluate the impact of the intervention to improve mathematics teaching in multigrade classes in Sri Lanka	Observational - experimental: Action research, pre- and post-tests of intervention and control schools	INTERVENTION Improve multigrade teaching of mathematics Scale of intervention/reform: 18 teachers from 10 rural multigrade schools over seven months Scale of study: All intervention schools	Positive: Post-tests scores for students increased in Grade 4 and 5 but not in Grade 3, 20% variance is explained by the intervention in the linear regression model, all teachers indicated they were very satisfied with intervention
Agrawal (2004) Upper secondary	L/L	India	To investigate the backwash effect of CBSE English-language examinations on teaching and evaluation practices	Observational - descriptive: Teacher questionnaire, analysis of examination question papers, informal interviews	REFORM New English curriculum and examinations Scale of study: 34 teachers	Positive: All teachers said they had changed from a structured, translation approach to a communicative approach, teachers taught reading and writing followed by oral skills, using a variety of pair and group work and role play, 90% used continuous assessment to assess oral skills, they had changed their formal assessment to be more skills based and to cover a wider variety of skills. In private schools there was greater variety of textbooks and reading materials

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
						Negative: Teachers in government schools had to use old textbooks, oral skills not worked on as not examined
Chavan (2003) Primary	L/L	India	To explore the idea of a 'magic wand' for teaching early reading and to describe the resulting accelerated reading programme	Observational - experimental: Pre- and post-tests of reading achievement for treatment group but with no control group	INTERVENTION Primary reading intervention: the pilot phase of Pratham's accelerated reading program Scale of study: 20,000 students	Positive: Improvement in word, paragraph and story level reading for summer camp pupils, improvement in paragraph reading level in school children
Sharmin and Roy (2011) Lower Secondary	L/L	Bangladesh	To evaluate BRAC's Computer-aided Learning and Mentoring interventions	Observational - descriptive: Observations, in-depth interviews, focus group discussions, quantitative data from school records	INTERVENTION Computer-aided Learning (CAL) for English and mathematics and student to student mentoring for improvement of teaching quality To provide quality initial and in-service teacher training, including professional development opportunities that can improve classroom practices Scale of study: Head teachers	Positive: Teachers and students more engaged in English classes, improvement of students in all 4 English language skills, more interactive lessons, more group work

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
					and teachers in 11 target rural secondary schools	
Shohel and Banks (2012) Lower secondary/upper secondary Multiple studies (Shohel and Kirkwood, 2012; Shohel and Power, 2010)	L/L	Bangladesh	To demonstrate how school-based technology-enhanced support systems impact on classroom practice and help teachers' professional development, illustrated by pre-pilot stage of English in Action project	Observational - descriptive: teacher interviews	INTERVENTION a pre-pilot intervention study of Technology-enhanced learning. Apple® iPod® was used to support teachers' teaching and learning in their school contexts. Part of English in Action. Aim: to gain understanding of teachers professional development during the pre-pilot phase of the project and ultimately then to significantly improve the teaching of English in all educational sectors using new mobile technologies across Bangladesh Scale of study: 12 teachers Underprivileged Children's educational Program Schools	Positive: clear models in audio-visual materials helped teachers put communicative techniques into practice (gestures, dialogues), less copying from board, more S participation, teachers and students improve language skills, teachers improve pedagogical skills, teachers are thinking more about teaching processes (how to make it active and enjoyable) rather than just content, easy to access materials, especially listening which students enjoy, teachers increase confidence.

STUDIES REPORTING MIXED OUTCOMES

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Hardman et al. (2009) Primary	H/H	Kenya	To evaluate Kenya's School-Based Teacher Development and Instructional Materials Project.	Observational - descriptive: interaction analysis of video-recorded lessons and semi-structured interviews with pupils, teachers, head teachers, parents	INTERVENTION An investigation into the impact of a national, school-based teacher development programme (SbTD) on learning and teaching in Kenyan primary schools - SbTD focuses on active learning and textbooks through distance education. It trained 3 key resource teachers (KRT) in each school. Scale of intervention/reform: In a 4-year period SbTD programme trained over 47,000 primary school teachers throughout Kenya in the three core subjects of English, mathematics and science. Scale of study: 102 teachers, 144 videoed lessons in 24 schools	Positive: KRTs had a more interactive style than non-KRTs; they used more explanation, praise, open questions and rephrasing follow-up and encouraged more questions and individual answers from girls and boys. They used more group, pair and individual work that was less ritualised and used more (relevant) TLMs. Teachers' practices were more equitable. Non-KRTs reported training, observation and support provided by KRT was useful. Pupils results improved according to national exams Teachers use L1 to facilitate students talk - but this was against official policy Negative: Whole-class, teacher initiated question-and-answer sessions interrupted by periodic, brief lectures remained the dominant discourse, so was reading from chalk board/ textbooks and pupil demonstrations. Follow-up remained low (3%)

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
National Council of Educational Research and Training (2011a, b) (and a 2006 ABL evaluation which was not coded)	H/H	Tamil Nadu, India	To evaluate the Activity-Based Learning (ABL) programme in Tamil Nadu	Observational - descriptive: A mixed method evaluation design, qualitative and quantitative analysis, interviews, observations, questionnaires , focus group discussions	INTERVENTION ABL Tamil Nadu is part of wider reform of Sarva Shiksha Abhiyan (SSA) for all children 6-14 to have access to schools, particularly for girls and marginalised children. Curriculum is organised via milestones (groups of competences) with different steps of the learning processes. Children move at own pace along learning ladders in groups and work with rich variety of materials. Teacher facilitates, monitors, records progress. Classes 1 and 2 are combined, sometimes 3 and 4 too depending on teacher numbers Scale of intervention: up-scaled in stages to all schools (37,500) run by the state government and the aided schools. Scale of study: 280 sample schools drawn from 15 districts in Tamil Nadu	Positive: Active methods, such as ABL materials, learning cards and audio visual materials, cards, puppet shows, self-learning materials, charts, used and demonstrated by majority of teachers Classrooms set up with groups, children learning at own pace Negative: Some resources were used poorly; some drilling and repetition was observed. In some cases teachers had to purchase own materials; teacher workload increased; monotony of teachers repeating instruction individually; some students feared the evaluation.

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Vavrus and Bartlett (2012) Upper Secondary	H/H	Tanzania	To explore how Tanzanian secondary teachers understood and implemented learner-centred teaching methods in the contexts in which they work	Observational - descriptive: Observations and interviews	INTERVENTION Workshop on learner-centred pedagogy and pedagogical content knowledge Scale of intervention/reform: 72 teachers Length of intervention/reform: 10 months Scale of study: 23 secondary schools teachers in 6 schools in Northern Tanzania	Positive: Teachers were positive towards LCE; they demonstrated given knowledge set and used group work to discuss and present answers Negative: Teachers did not encourage higher thinking to allow students to arrive at different conclusions
Atinyelken (2010a, b) Primary	H/H	Uganda	To explore teachers' views on child-centred pedagogy (CCP), their classroom practices, and the perceived challenges in implementing CCP	Observational - descriptive: Interviews and observations	REFORM National curriculum reform promoting child-centred education and an integrated, thematic approach using active learning, participation and local language; continuous assessment Scale of intervention/reform: National Curriculum introduced in 2006 Scale of study: 8 schools where the thematic curriculum was piloted; 34 teachers, four	Positive: Teachers were positive towards CCE and had depth of understanding in CCE pedagogy; curriculum was seen as well designed and well intentioned; students worked in groups; teachers made more use of TLMs; greater variety of approaches observed with some structured pedagogy re planning, objectives, making links with prior learning; more use of formative assessment Negative: Small number of teachers managed major

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
					deputy head teachers and six head teachers. 28 lesson observations in P1 and P2 classes	changes while the rest made minor and formalistic changes to more traditional frontal teaching; little change observed in students' interaction or meaningful group activities
Clarke (2003) Primary	H/H	India	To understand the effectiveness of the District Primary Education Programme (DPEP) reform in India and to explore the factors which impact on teachers' attempts at transforming their own pedagogy	Observational - descriptive: Interviews and observations	REFORM Curriculum reform of active and joyful learning, pedagogical reform targeted at girls and children from Scheduled Castes. Intensive teacher training for 10 days, in-class support by co-ordinator; monthly sessions at cluster level Scale of reform: DPEP is now being implemented in 18 states in India. Karnataka, a southern Indian state, is implementing the DPEP in 11 of its 26 districts Scale of study: 234 teachers, 50% students from Dalit/Scheduled Tribes	Positive: Teachers positive about the learning and minimum learning levels; good use of demonstration; children active; teachers consistently using real objects with little reliance on textbook and drawing on out of school learning contexts; teachers demonstrated greater understanding of marginalised students Negative: Difficult to implement meaningful CCE; integration of CCE into traditional rote methods; students' prior knowledge not brought into learning; teachers not fully engaged with reform

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Arbeiter and Hartley (2002) Primary	H/H	Uganda	To collect information about the practical implications of integrating children with disabilities in mainstream schools from the perspective of the teachers and pupils.	Observational - descriptive: Observation, interviews, focus group discussions, and a log book	Existing conditions in REFORM context: From national policy, integration of children with disabilities into mainstream schools - Salamanca Declaration Scale of study: 28 teachers, 3 head teachers and 23 students interviewed in 3 schools, but included on contingent criteria because of the number of teachers and focus on students with disability	Positive: Some teachers reported confidence in identifying and teaching disabled students; positive attitude change of parents re the inclusion of their children; small proportion of teachers had some strategies to adapt to disabled students Negative: Predominant mode of instruction was teacher-led or lecture. Group chanting and repetition of answer observed. Little differentiation given to disabled students; teacher-directed lessons using spoken language only reached small number of students
Coffey International (2012)	H/H	Ghana	To look at characteristics of Activity-Based Learning (ABL) and demonstrate positive results, to justify their scaling up	Observational -descriptive: Interviews, focus group discussions, student quasi-experimental approach involving ABL intervention and control sites to test	INTERVENTION Customised ITE for SfL and two follow-up courses after three weeks and 6 months, but government just discussing ABL implementation. Scale of study: 181 teachers, 900 randomly selected pupils, 23 head teachers, 24 Ghana Education Service (GES)/Development Partner	Positive: Teachers circulated around class, students more on task, used ABL methods integrated with traditional, were warmer and friendlier, and provide better feedback, students ask questions. Negative: few TLMs, students sit in groups but work independently, little individual attention, poor head teacher

Appendix 8: Summary table of studies with details of study aims and methods used

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			and/or the incorporation of their successful characteristics into formal early basic education (KG and P1-3)	students	representatives and 18 purposively selected representatives of the colleges of education.	support, lack of parental support for ABL methods in ABL intervention schools
Khamis (2011) Primary	M/H	Somalia	To evaluate the efficiency and effectiveness of the Integrated Quranic Schools (IQS) pilot schools	Observational - descriptive: Case study of intervention schools as well as control schools: interviews, focus groups, classroom observations, document analysis	INTERVENTION Religious schools integrated with formal school curriculum and qualified teachers Scale of intervention: Not clear but many schools in Puntland and Somaliland Scale of study: 8 schools, 20 teachers	Positive: Use of co-operative learning/peer support in Quranic classes; teacher gave attention to groups and individuals and clear objectives, differentiation; teachers talked 50% of time; use of discipline and memorisation seen as positive and learner-centred Negative: Bifurcation of longer-serving Quranic teachers from subject teachers; teachers were not using new TLMs
Barrett (2007) Primary	H/M	Tanzania	To explore teachers' beliefs, and practices	Observational - descriptive: interviews and	Existing conditions (no intervention/reform) Scale of study: 32 interviews in 18 schools spread across 4	Positive: Effective use of questions and answers in whole class seen as participatory; building on students' prior

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			using Bernstein's framework of performance and competence models	observations	districts	knowledge; teachers used a mixed 'pedagogic palette'; some use of inclusive pedagogies; more varied methods in Swahili and mathematics. Negative: Few affirmative comments; some transmission idea and model of teaching
Kunje et al. (2003) and Kunje (2002) Primary	M/H	Malawi	To explore the strengths and weaknesses of the Malawi Integrated In-service Teacher Education programme (MIITEP)	Observational - descriptive: Interviews, observations, focus group discussions, questionnaires, case studies/student autobiographies, document analysis, examination/test results, data from MIITEP databases	INTERVENTION Training for secondary school leavers using mixed mode college and school-based training over 24 months to train as primary teachers with focus on new learner-centred methods Scale of intervention: National Scale of study: 20 teacher educators; 27 trainee case studies; 480 trainee questionnaires	Positive: Where trainees prepared in advance, lessons were participative. Zonal meetings promoted participatory methods. Trainees' ideas/knowledge when assessed was aligned with handbook. Handbooks for trainees very useful. Trainees integrated into schools by being given responsibilities. Negative: Tutors used expository methods with some question and answer and basic group work. Practicum assessment instrument did not focus on participatory methods. Trainees ideas centred on transmitting knowledge. Tutors underqualified and lacked CPD.

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
						Trainees' mathematics and English subject knowledge remained low
Nakabugo et al. (2006) Primary	M/H	Uganda	To investigate possible forms of class organisation and teaching styles that are suitable for mediating learning in large classes	Observational - descriptive: Interviews, observations (using structured instrument) and document analysis	EXISTING CONDITIONS Large class sizes following Universal Primary Education (UPE). Identifying practices that work with large classes. Scale of study: 35 teachers in 20 schools	Positive: Group work (31% lessons) enabled teacher movement and sharing of resources. Teachers monitored individuals. Team teaching seen (17% of lessons) to assist with discipline, material distribution. Use of songs, story-telling and questions and answers to engage students. School-based staff development focused on strategies for large classes; use of low-cost materials from local surroundings Negative: Group work dominated by more able peers; factual and rote activities predominated; longer lessons did not engage young children; daily homework too much; too little time given to students practising what was taught; too many exercise books per subject and student

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Conway et al. (2012) Lower Secondary	H/M	Uganda	To examine the effectiveness of teachers, role of curriculum and assessment and the extent to which the desired move towards more learner-centred methods was being achieved	Observational - descriptive: Interviews, observations	INTERVENTION Secondary Science and Mathematics Teachers Programme (SESEMAT) to shift towards learner-centred education, use of more TLMs. Scale of study: 16 science and 16 mathematics teachers in 16 schools in 4 regions	Positive: Teachers positive towards LCE; some teachers tried to bring in discovery learning; effective teacher-centred approaches through lively interaction, level of preparedness, commitment, time on each activity Negative: Dominance of teacher-led expository pedagogy - whole-class, lecture, teacher-led demonstration, discussion, individual work, question and answer; teacher confusion over what problem solving was
Sarangapani et al. (2013) Primary	M/H	India	To look comparatively at private and public schools to assess how DPEP and SSA, alongside the 2009 Right to Education Act that	Observational - descriptive: Interviews, observations, document analysis, quantitative data on enrolment/attendance	EXISTING CONDITIONS (in context of reform) Over the last two decades, two national education 'missions'—the District Primary Education Programme (DPEP) and the Sarva Siksha Abhiyan (SSA) —have led to the expansion of access and enrolment in government elementary schools	Positive: Progressive pedagogies seen using dialogic and interactive methods; teachers autonomous, draw on students home backgrounds; students from upper SES taught using most progressive pedagogies; students from lowest SES taught using progressive pedagogy if in NGO/charity schools

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
			includes all children, are being implemented		Scale of study: 85 schools in Delhi, Hyderabad, West Bengal	Negative: Progressive pedagogies seen in less than a quarter of classes; most schools had a limited curriculum e.g. no arts, PE; pedagogy in private school focused on copy, repetition and fear of teacher
Vavrus (2009) Lower and Upper Secondary	M/H	Tanzania	To assess the implementation of constructivist approaches advocated in policy and curriculum	Observational - descriptive: Ethnography: participant observation	EXISTING CONDITIONS Scale of study: 10 month ethnographic study at teachers' college	Positive: Student teachers adopt aspects of LCE, integrate them with features of Tanzanian pedagogic tradition to fit large classes Negative: Student teachers do not have time/support/training to practise enacting more constructivist viewpoints and they have not fully grasped LCE by graduation
Holland et al. (2012) Primary	M/M	Uganda	To assess the implementation of the thematic curriculum	Observational - descriptive: Interviews and observation	REFORM The thematic curriculum reform Scale of reform: National Scale of study: 48 teachers in 16 schools in 4 regions	Positive: Teachers able to provide meaningful contexts for students in large classes to learn using dialogue and interaction Negative: Life skills poorly incorporated; teachers rarely connect lessons to students' life experience; continuous assessment difficult with large classes; inclusion of students

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
						with special educational needs difficult to track
Guzman et al. (2000) Primary	M/M	Lao PDR	To explore the effectiveness of the Teacher Upgrading Programme (TUP)	Observational - descriptive: Document analysis, observations, interviews, questionnaires , survey	INTERVENTION A mix of short/long residential courses, school clusters, in-school/class experience and self-study modules to upgrade the skills and knowledge of the very large cohort of untrained and unqualified teachers Scale of intervention/reform: Since 1992 more than 4000 teachers in 48 districts have been trained Scale of study: 25 schools	Positive: Teacher-directed approaches where students actively engaged, participate in whole-class and individual questions, demonstration at front; teachers prepare own TLMs despite lack of resources; improved student performance, attendance and increased completion rates. Negative: Promoted 'child-centred' methods rarely seen; teachers lack knowledge of multigrade teaching
Lall (2011) Primary	M/M	Myanmar	To explore the use of child-centred pedagogy in monastic schools	Observational - descriptive: Interviews, observations and focus group discussions	INTERVENTION Child-centred pedagogy in monastic schools Scale of intervention: 196,458 children enrolled in monastic schools across the country Scale of study: 10 monastic schools, 68 teachers, 19 teacher trainers	Positive: Implementation of CCE varied - some group work; younger women teachers more likely to use CCE; students reported as more enthusiastic, no longer afraid Negative: Resistance from older male teachers

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
Blum (2009) Primary	L/H	India	To look at innovative practices in multigrade schools in India	Observational - descriptive: Qualitative case study: semi structured interviews with programme directors, teachers and national policy makers and observations of class/school; also quantitative data	INTERVENTION NGO: Rishi Valley Institute for Educational Resources (RIVER) support for small, rural, multigrade schools Scale of study: Several small rural schools	Positive: Greater attendance, less drop-out; more students achieving class 6 government exams; greater community participation, esp. women; government textbook deconstructed and reorganised with learning activities and locally relevant stories/images etc.; activities are arranged in a sequence and students follow at own pace; teachers monitor, give feedback; greater pupil-pupil interaction; variety of strategies: teacher-led, group-led or self-guided; children monitor their own progress Negative: TLMs need to be replenished.
UNICEF (2008) Primary	M/L	India	To evaluate UNICEF India's Quality education Package (QEP) for primary schools	Observational - descriptive: Interviews, observations and documentary analysis and student tests	INTERVENTION UNICEF India's holistic, gender-sensitive, quality education package (QEP) for implementation in primary schools in 2003 to support the government of India's national SSA Scale of intervention/reform:	Positive: Quality now seen as essential not desirable. Innovative TLMs in local language beginning to be used by QP schools (but teachers not yet fully conversant. Class 3 pupils performed better in tests in QEP schools; 'learning ladder' cards implemented successfully (to some extent) - letting pupils move at their own

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
					13 states and 25 districts Scale of study: Teachers in QEP (103 schools) and non-QEP (38 schools)	pace. Some teachers in some QEP schools able to use QEP materials as springboard to innovate Negative: Aim to build school gardens rarely met; little involvement of parents and communities; many parts of original programme diluted.
Grimes et al. (2011) Primary and Secondary	L/L	Lao PDR	To report on the evaluation of Lao PDR's Inclusive Education Project (1993-2000)	Observational - descriptive: quantitative data from questionnaires (but of doubtful quality), lesson observations, interviews with all stakeholders (parents, local community members, teachers, students, school principals and local officials),	REFORM The Lao People's Democratic Republic Inclusive Education (IE) Project (1993-2009) aimed to support the participation of all children in school, with a particular focus on disabled students. Scale of intervention/reform: National Scale of study: 26 teachers observed	Positive: Project schools were outperforming non-project schools by significant margins in key areas: net enrolment, survival in grade, grade passing and inclusion of children with disabilities; lower drop-out rates and grade repetition rates; most of the 26 teachers used some child-centred inclusive practices; most lessons planned linked with previous lessons and some linked to pupils previous knowledge, local context and interests; teachers paid attention to struggling pupils and used peer-teaching and group work; teachers used, created and displayed own TLMs; they were beginning to

Appendix 8: Summary table of studies with details of study aims and methods used

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/ intervention? What was tried - what was the intervention?	What happened in practice?
				ministry-level data collected on all schools and used for comparison with IE schools		experiment with different questions Negative: Teachers had limited understanding of how to use group work effectively; many questions still general, ineffective, closed

STUDIES REPORTING MOSTLY NEGATIVE OUTCOMES

Study, level of education	WoE A & B	Country	Study aims	Methods used	What pedagogy/intervention? What was tried - what was the intervention?	What happened in practice?
Akyeampong (2003) Primary	H/H	Ghana	To gain insights into the philosophy of teacher education and pedagogy and understand NQTs' perception of their college training	Observational - descriptive: Mixed methods - questionnaires, interviews, observations, documentary analysis.	EXISTING CONDITIONS Teacher education - initial and Inset; curriculum, delivery; NQT perceptions on training Scale of study: 4 training college 400 trainees, 300 final year trainees, 12 NQTs	Positive: NQTs continue to use college notes in own teaching; some evidence of group work but mostly question and answer and demonstration Negative: Trainees have low academic success; tutors do not know or draw on trainees' backgrounds; tutors use lecture mode, dictating notes, prescriptive teaching sequence to be taught in schools; they discuss LCE rhetorically
Alexander (2001) Primary	H/H	India	To identify similarities and differences within and between five countries' approaches to primary education in terms of pedagogy	Observational - descriptive: Interviews, observation, documentary analysis and photos	EXISTING CONDITIONS Five-country comparative study of pedagogy. In India, studies looked at schools outside the districts where major reforms were happening or just about to take place. Scale of study: a mix of urban, and rural, smaller and larger primary schools in India	Positive: Different pedagogical model used in teaching music and dance, not rote and recitation but apprenticeship, imitation and disciplined practice. Teaching uses knowledge, skills, insight, feeling, intuition, flexibility, with some scaffolding. Teachers in pastoral role - home visits; schools have a role to teach good, clean, virtuous ways to live. Negative: primary teachers

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						lack autonomy - can only change teaching method with head's permission. Teachers have low motivation and status; short (30 min.) lessons with predictable structure, often missing conclusions; frontal teaching with little pupil-pupil interaction or pupil talk; ritual understanding of propositional knowledge, low cognitive demands; no extra help or homework for students who did not grasp lesson - widening ability gap in every lesson; closed questions: recall, single-word answers, right or wrong answer; ritualised relationship between teacher and students, and teacher, students, textbook and curriculum
Ampiah and Mankoe (2006) Primary Lower Secondary	H/H	Ghana	To investigate how quality education is provided in different contexts	Observational - descriptive: Observation, interviews (pupils), questionnaire (teacher and headteacher), teachers' lesson notes and	EXISTING CONDITIONS Comparing practices in different contexts: rural, urban, public, private at primary and lower secondary; identifying good practices and weakness. Scale of study: 26 teachers, 6	Positive: Exercises given to pupils in all schools (though unchallenging in some cases); majority of students in private schools had access to textbooks. Headteachers observed and reported good practices in all the schools; good lesson presentation, involvement of students in

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				pupils' notebooks	head teachers in 6 private and public schools	class, extra classes for pupils, and head teacher support for teachers at classroom level Negative: In all schools, chalk and talk methods observed, teachers asked most of the questions and practical hands-on activities were rare. Students reported that teachers copied notes on to the board for them to copy. Limited access to textbooks in public urban and rural schools; a dearth of TLMs, particularly in private and rural schools. Headteachers did not readily mark lesson notes
Bhattacharjea, Wadhwa et al. (2011) Primary	H/H	India	To assess the progress of students over the course of a year and link this to a variety of variables using a longitudinal design	Observational - analytical: Achievement tests in mathematics and language, school conditions, 800 hours of observation data, teacher questionnaires	EXISTING CONDITIONS Baseline and endline study of teaching and learning in rural Indian schools Scale of study: Sample is drawn from 15 districts located in 5 states, and consists of 900 schools and close to 30,000 students	Positive: There appears to be a clear relationship between 'child friendly classrooms' (identified by 6 indicators) and learning outcomes but these practices are rarely used. In mathematics, pupils' mean score increases as teachers' increases Negative: Most frequently used methods were writing on blackboard and reading from

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						textbook. Many classes were multigrade but few used appropriate teaching methods. Teachers could generally solve basic mathematics problems, struggled more with applying knowledge and struggled most with creating their own problems for students. In language, teachers performed better in simple tasks e.g. correcting spelling mistakes, than writing summaries. Children sitting in the front row had higher test scores than those sitting elsewhere. Classrooms had basic facilities e.g. blackboards but rarely had pupils' work displayed; children sat in rows facing the teacher
Hardman et al. (2008) Primary	H/H	Nigeria	To provide analysis of the interaction and discourse of practices in primary school classrooms	Observational - descriptive: Video recordings of lessons and teacher questionnaire	EXISTING CONDITIONS Interaction and discourse analysis in primary classrooms especially IRF pattern Scale of study: 42 teachers and 14 schools	Negative: Ritualised practice of cued elicitation and 'teacher check'; 98% teacher talk with closed questions/factual recall; teachers seldom responded to students' answers; clapping and praising common but rarely followed up; mainly choral and short responses; boys more likely to answer than girls; girls less likely to be asked in

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						mathematics. Only 1/42 teachers used group work though 80% said it was important and 60% said they used it. Code-switching in $\frac{3}{4}$ lessons though 23% said they rarely used it
Hardman et al. (2012) Primary	H/H	Tanzania	To explore the training needs of teacher educators for teacher education at pre and inset level	Observational - descriptive: Interviews, videoed lesson observation, lesson plan documentation and primary leaving exam results	EXISTING CONDITIONS Baseline studies of teachers' classroom interaction and training needs of teacher educators to support new overarching ITE-CPD programming Scale of study: 32 primary schools, 232 teachers; 3 training colleges, 18 teacher educators	Positive: 36% of teachers had undertaken INSET with a pedagogical focus in the last 5 years. Negative: Great variation across districts; 78% of teachers missed out part of a 3-part lesson structure; more student-centred activities took up 14% of time; high use of cued ritualistic elicitations with no focus on learning; closed questions and choral responses; teachers did not follow up on student response; heavy reliance on copying notes from board
Lefoka and Sebatane (2003) Primary	H/H	Lesotho	To study teacher education in Lesotho holistically	Observational - descriptive: document analysis, questionnaires,	EXISTING CONDITIONS of teacher education in Lesotho Scale of study: 90 student	Positive: NQTs could mainly manage their classes well and maintained good relationships with pupils. NQTs, for the most part, knew the subject matter.

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				interview schedules, classroom observations, autobiographical essays, student diaries and discussions with focus groups	questionnaires; 27/90 in-depth sub-study; 8 lecturers for curriculum sub-study; 121 teaching practice students, 10 lecturers, 2 teaching practice co-ordinators for teaching practice sub-study; 44 lecturers, with 14 intensive in college sub-study; 70/200 NQT questionnaires	School principals value the graduates as source of information Negative: Most teaching (in ITE) is transmission-oriented with little emphasis on critical analysis, creative thought or learning to exercise professional judgement. Lecturers use questions but do not allow for independent thinking by student teachers. Group work is common but is not well-organised or guided. Lessons are not well structured and often end abruptly. Lecturers have poor time keeping. NQTs' lessons were teacher-centred with little interaction. Group work was rare. Teachers struggled with content. Tests can be passed by memorising materials. Students rely on hand-outs (photocopied notes) and the chalkboard
Pontefract and Hardman (2005) Primary	H/H	Kenya	To explore the role of classroom discourse in supporting	Observational - descriptive: Observations, interviews,	EXISTING CONDITIONS Discourse analysis of discourse strategies of 27 Kenyan primary teachers	Negative: All lessons observed used teacher-led recitation - use of textbook and/or chalkboard to transmit recipe knowledge for rote learning;

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			children's learning in Kenyan primary schools	questionnaires	Scale of study: 27 Kenyan primary teachers	tasks were undifferentiated; teacher monitored from the front; discourse dominated by Initiation-Response-Feedback (IRF) structure and with very limited feedback to build on students; mainly closed questions asked with little probing of students' answers; no opportunity for children to support each other and work collaboratively; repetitive and monotonous model of learning with student participation as means of maintaining control
Smith et al., 2005 Primary	H/H	India	To provide a detailed analysis of the discourse practices found in privately funded primary schools for the poor.	Observational - descriptive: Computerised observations, video recordings of lessons	EXISTING CONDITIONS Study of classroom interaction and discourse in privately funded primary schools for the poor. Scale of study: 138 teachers in 15 privately funded schools for the poor	Negative: Pedagogy dominated by teacher-led recitation; transmission modes using chalk board or textbook to transmit recipe knowledge for rote learning (so testing recall). Little attention given to securing understanding. Limited cognitive engagement and mechanical tasks. Whole-class teaching with tasks not differentiated for ability. More than 45% of the time pupils listen to teacher explaining from the front. Questions asked require recall and single-word

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						answers, often chanted in choral response with very little teacher feedback. Quick-fire succession of tasks but often not logically linked. Lessons are reiterative rather than developmental. Learning tasks emphasise factual propositional knowledge. Pupils are seated in rows, with those at the front more active and the other rarely participating. Very little pupil-pupil interaction - except pair presenting at the front
Akyeampong et al. (2013) and Pryor et al. (2012) Primary	M/H	Ghana, Kenya, Mali, Senegal, Tanzania and Uganda	To assess the impact of initial and continuing education of teachers on the practice of teachers in reading and basic mathematics	Observational - descriptive Questionnaires (trainees and NQTs); document analysis; interviews (NQTs, tutors), focus groups (trainees), lesson observations (tutors and NQTs) and post-observation discussions	EXISTING CONDITIONS Impact of ITE and CPD on teachers' knowledge and practices and especially, teaching reading and basic mathematics in the lower primary grades Scale of study: Quantitative data came from a questionnaire administered to trainees from four different colleges in each country (n = 4,699) and NQTs (n = 1,079)	Positive: Trainees and NQTs held ITE influential in terms of impacting on their practice. They also expressed confidence in their ability to teach basic numeracy and reading but this was often not backed up by evidence as they perceived success as repeating the standardised 'correct' approach learnt in ITE without considering pupils' understanding. The use of manipulatives was observed in training colleges and in schools but only to make lessons more appealing not to connect the

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				(trainees and tutors)		<p>materials to the concepts</p> <p>Negative: Trainees taught in large groups through lecture method in training colleges. A very prescriptive, 'correct' approach is taught in ITE which NQTs follow to the core without reflecting on it within their classroom context. The simulation classroom activities provided in ITE do not take into account marginalised children from poor backgrounds who do not have any learning support at home. There is very little emphasis on reading in ITE. Teaching practicum is too short, often with no time to reflect at the end and no connection to course. Trainees were not offered the experience of teaching early primary grades during practicum. Trainees were poorly supervised by tutors and not mentored by experienced school staff. ITE did not prepare trainees for the realities of multilingual classrooms. Training is primarily geared towards</p>

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						content knowledge with little emphasis on method or pedagogic content knowledge. Teaching for meaning/ comprehension in reading was found particularly difficult by NQTs. NQTs rarely reflected on teaching practices from the point of view of their impact on students' learning. Trainees were least prepared to deal with marginalised groups and NQTs often blamed students for poor student learning
Ngware et al. (2012) Primary	H/M	Kenya	To explore teaching practices and differences across subjects in high- and low-performing primary schools in Kenya	Observational - descriptive: Exam data, observation checklists, questionnaire and filming of actual lessons	EXISTING CONDITIONS Exploring teaching practices and differences across subjects Scale of study: 201 teacher questionnaires, 213 observed lessons in 72 schools - not clear if same teachers again or not	Negative: Teachers taught in similar ways regardless of teaching experience, school category and subject. The teaching style is predominantly teacher-centred, particularly command and practice style. 'Active teaching' takes up 2/3 of lesson teaching, concentrated on teacher checking on how individuals carry out teacher-assigned tasks, teacher asking individuals questions and teacher demonstrating to the whole class

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Singal (2008) Primary	M/H	India	To explore how the inclusion of disabled children was working in practice	Observational - descriptive: Use of interviews and observations	EXISTING CONDITIONS Inclusion of disabled children in three types of schools Scale of study: 11 heads, 22 mainstream primary school teachers, 7 special educators and 5 school counsellors in private, private aided and 1 government schools	Positive: Some teachers made minor adjustments to having disabled children. Some teachers partnered a disabled child with an abled-bodied child. Negative: Teachers tended to communicate far more with the able bodied partner and talk through them to the disabled child. There was an absence of collaboration between different stakeholders and teacher. Teachers made only a few structural adjustments within the dominant chalk and talk pedagogy adopted in the classroom. They also showed high dependency on 'others', namely parents and special educators, for the child's learning. Despite 'inclusion' of disabled children into mainstream schools they continued to be excluded from the curriculum and culture of the school.

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Ackers and Hardman (2001) Primary	M/M	Kenya	To explore classroom interaction in Kenyan primary schools as a part of national baseline study for Ministry of Education	Observational - descriptive: Classroom observations of lessons	EXISTING CONDITIONS Classroom interaction in rural and urban Kenyan primary schools Scale of study: 20 teachers in 20 primary schools, 10 urban, 10 rural, and their pupils in S3 and S6 classes; 31% of teachers in S3 had no initial training compared to 10% at S6. 25% of teachers were male	Negative: High number of closed, teacher-directed exchanges interrogating pupil's knowledge. Very few pupil asked questions. Little higher-order questioning or responding to students was observed. Answers were mostly choral work, with boys answering more than girls. Very little praise used as feedback. Time spent on seatwork was 34% and that on group or pairwork was 6%
Alhassan and Adzahlie-Mensah (2010) Primary	M/M	Ghana	To investigate the contribution that primary teachers make to pupils' learning experience and how they respond to irregular attendance or slow progress	Observational - descriptive: Observations and interviews	EXISTING CONDITIONS Primary teachers role in pupils' learning experience in public and private schools Scale of study: Four rural schools (one private and three public). Four head teachers, 24 teachers and 24 pupils	Negative: Poor record keeping of teacher and pupil attendance (teachers and head teachers were often late but not recorded). Headteachers do not check/observe teachers to see practices. Teachers falsify pupil assessment records to show more exercises done. Caning is used as punishment for lateness. Teachers teach over break times or give students too long breaks. Teachers use students to work on their farms when they should be doing PE. Pupils could not remember what they

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						had been taught the previous day. No uses of class discussions, group work, brainstorming and experimentation were observed. Only questions and answers were observed but pupils did not ask any questions. The use of chalk board was poor
Dyer (2008) Primary	M/M	India	To examine how a small sample of primary teachers approach literacy teaching and learning in socio-economic contexts of disadvantage	Observational - descriptive: Literacy-focused action research; teacher diaries, discussions and reflections in workshop and observations	EXISTING CONDITIONS (in context of reform) To move towards a joyful pedagogy and to reconstruct the role of teacher as facilitator of learning rather than transmitter Scale of intervention/reform: National Scale of study: 25 teachers	Positive: Despite difficult conditions, some teachers adopted more active approaches with teaching aids and games; sometimes intelligent children were used to teach those who were behind. Pupils enjoyed songs and poems but these were used as a 'time out' Negative: Teachers located difficulties within social context (poverty, attendance, poor nourishment), overlooking

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						pedagogical reasons/ weaknesses for slow progress. Teachers rarely recognised the efforts pupils were making; no differentiation and essentialised labelling of children as intelligent, average and weak. Teachers did not follow new order (simple before complex), stuck to traditional order and did not include listening and speaking skills for literacy development; narrow focus on reading and writing
Dyer et al. (2004) Primary	M/L	India	To evaluate the functioning of selected DIETs within the decentralised framework of District Planning initiative	Observational - descriptive ethnographic approach	REFORM DIETs (District Institute of Education and Training) are district centres for ITE and CPD. Scale of study: six DIETs, two each in the states of Gujarat, Madhya Pradesh and Rajasthan. Teachers and teacher are educators considered 'ordinary'.	Positive: More effective trainers usually worked at cluster level and had more experience - they were able to engage teachers and provide nuanced explanations based on practical experience Negative: DIETs were not seen as producing good results. Teacher training was focused, like secondary teaching, on content, and was oriented on marks rather than on pedagogy/community. Lectures were used in teacher training.

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						Teachers and trainers held poor attitudes to low SES students
Nsibandé and Mobida (2012) Primary	M/M	Swaziland	To explore the challenges experienced by primary school teachers in Swaziland when using Continuous Assessment as a tool to improve teaching and learning.	Observational - descriptive: Classroom observations and stimulated recall interviews	EXISTING CONDITIONS Primary teachers' use of continuous assessment Scale of study: 8 x Grade 6 social studies teachers	Negative: Teachers used activities presented in the curriculum materials and guides uncritically even when they did not corresponds with lesson objectives. They did not think through the position from the perspective of pupil learning

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Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre)
Social Science Research Unit
Institute of Education, University of London
18 Woburn Square
London WC1H 0NR
Tel: +44 (0)20 7612 6397 <http://eppi.ioe.ac.uk> <http://www.ioe.ac.uk/ssru>
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Please contact the Institute of Education for assistance:

telephone: +44 (0)20 7947 9556

email: info@ioe.ac.uk